

Flight, September 7, 1912.

FLIGHT

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ST. MALO-JERSEY HYDRO-AEROPLANE RACES.—Renaux, on the Farman biplane, rounding the St. Malo lighthouse.

EDITORIAL COMMENT.

The Honours and the Honoured.

In a portion of last week's issue of *FLIGHT* we were able to publish the awards in connection with the Military Aeroplane Trials, and to that extent were able, even as a weekly newspaper, to provide our readers with public information simultaneously with its announcement by the modern hourly press. But, those who obtained their first news from *FLIGHT* and those who did not, alike are long since aware of the recipients of the Government's prizes. They know that Cody won the first prize of £4,000 open to the world, and the first prize of £1,000 reserved to British machines. They know that the French Dep. secured the second prize of £2,000 open to the world and that there was no second British prize awarded, albeit the two Bristol monoplanes and the British Dep. secured a third prize of £500 each. And, lastly, but by no means least, the Avro, the Maurice Farman, the two Hanriots, and the two Blériots received their £100 each in consolation for having submitted to all the tests.

So, here, to the superficial mind, is the result of a month's labour in the wind and wet on Salisbury Plain; here are the honours that the greatest aeroplane trials on record have produced. It would be less than human if there were other than much heartburning, and, as all men *are* human, the effect of the prize list is now an influence of the moment that overrules by its intensity much that later will be recognised as proper to a sensible point of view.

That point of view is best taken up by the recollection that the honours must be allotted by an arbitrary scale such as bound those whose duty, and by no means easy task, it was to act as judges in this long drawn out event. Remember, it was a competition for prizes. The conditions were known in advance, and, indeed, would-be participants made a great outcry that they should be told of them so that they might design accordingly. First and foremost, therefore, we must assume that the judges were in honour bound to abide by so many of the conditions as were already fixed.

One of them, for instance, was the necessity of climbing at the rate of not less than 200 ft. a minute. In this the Avro failed; no more need be said regarding its lack of honours, but in its honour much may be said, as is shown elsewhere. Its failure to do the climb is, according to the estimate of our Technical Editor, only represented by an absence of some six horse-power or so, a small matter that could easily be set right by the use of a more powerful engine, but which could not readily be changed on the machine as it stood. It was always pretty clear that the authorities set great store by climbing, and to have waived the minimum—as the judges had power to do had they so desired—would certainly have been to have conveyed a most misleading impression of what is regarded, for the time being, as a military necessity. Great credit is, for instance, due to the Avro for having, by sheer originality in design, afforded such thorough protection and ease of communication to the occupants of the machine; these advantages were considered to be desirable in the 10th clause of the original regulations, but the same clause specified for a wide range of view, and again, as at present designed, the Avro probably falls short of the essential minimum in this regard.

We take the case of the Avro at some length, because it seems to us to be such an outstanding example of the situation, and because we can so honestly say of it that

it is a machine that went through the trials with all honour, even if in the end it failed to win a prize. It is a most promising design, as anyone who studies our technical articles elsewhere cannot fail to appreciate, and the businesslike manner in which those representing the firm coped with unexpected circumstances should do much to establish A. V. Roe and Co., once and for all, in the front rank of the British industry.

Space prevents us from giving vent to an equally extensive imagination as to the why and wherefore of the position of every other machine in the prize list, and indeed, it is scarcely our place to do so seeing that the Government will, presumably, be presented with an official report on the whole affair and will, let us sincerely hope, immediately authorise its publication. The importance of these trials is not to be measured by the momentary significance of this or that machine having been awarded a hundred pounds or a thousand pounds, but rather is it to be gauged by the amount of helpful information that is therefrom forthcoming. To the best of our ability we have endeavoured to make good with the information so generously placed at our disposal, and, for that much, those who profit by it must thank the competitors and the officials who both whole-heartedly co-operated with us in our work.

But, the immediate field of the aeroplane is in military service, and above all other considerations, scientific or otherwise, stands the desirability, nay necessity, of knowing more clearly what those independent men who acted as judges have to say on the subject from their own point of view. This is of the utmost consequence to the aviation world, and the Government certainly owes to the losers in the trials the publication of any report that may be made, just as much as it owes to the winners the payment of their prize money.

It is important, and it is essential, to know this, because otherwise it is not possible properly to foresee the lines along which progressive firms may usefully develop their construction. Thus, for example, the Blériots and the Hanriots and the Maurice Farman alike bring up an honourable rearguard. Both Hanriots were faster than any other machines in the trials; it follows, therefore, that even speed can be bought too dearly. Perhaps the outlook from these machines is not as complete as was desired, or perhaps some other consideration may be a predominating beam as seen by the military eye. Merely regarded as machines, the results of our calculations show that the Hanriot no less than the Dep. is a standard of modern monoplane efficiency. The Blériot machines too, are, in themselves, such standard types that again it becomes a matter of concern to see what place they hold in the British military scale of utility. Their flying in the trials seemed to be in keeping with their design, and, being the lightest machines in themselves, they, not unnaturally, showed a high efficiency on the basis of useful load carried. Or again, take the Maurice Farman, a machine so safe at low speeds that it invites almost any beginner to play with it. That, too, from the military point of view is evidently not an overpowering advantage when, as seems to evolve from our calculations, such large and lightly loaded wings form their own handicap in speed.

Working thus upwards, it is not difficult to see the reasonableness of the third prize awards in the British section. A little more time spent on the design, a little

more concentration of effort in putting their two monoplanes earlier through the tests, and the British and Colonial Co. might well have relieved the National Exchequer of £2,000, instead of the £1,000 that has fallen to their lot—which, by the way, is as much as the Cody receives in this section. Both Bristol monoplanes achieved the specified essential minima: but, even so, in our opinion their performances are not yet up to the standard of their design. For example, we believe that they are at present too heavy for their wing area, just as the Avro is under-powered for its weight, and that in a few months they will be climbing their first thousand feet at over 300 ft. a minute. The British Dep. must needs take some reflected glory from its French prototype, which won the second prize open to the world; for a contributory cause at least to the excellence of that performance was the businesslike management of Mr. Santoni, who allowed his own particular interests to stand aside so that the combined efforts of the Deperdussin camps might be concentrated on giving proper attention to the French machine that Prevost flew. Apparently, from our figures, the British Dep. weighed more than the French Dep. but as there is some question as to the exact flying weight of the British Dep. it is, perhaps, only fair to take the French Dep. for criticism. It exceeded its anticipated efficiency, but was a few miles per hour below the speed appropriate to its design. In other words, it ought to be able to carry more load than it did, without overloading, but at the same time it ought to fly a little faster, which, in all probability, it would do if tested on a calm day.

The Dep. is an uncommonly fine monoplane and if we may regard the dimensions, weights and loading, as being a standard of comparison it should be observed that the machine may be virtually described as a large area monoplane. By large area is not meant so much the absolute dimensions as the loading, and not the loading only so much as the loading in conjunction with the load per horse-power: in a word our factor X and all it can convey. The French Dep. and the Cody form an instructive comparison. Their anticipated efficiencies are 74 and 65 per cent. respectively, while their demonstrated efficiencies are 79 and 69 per cent. respectively.

And of the Cody, what shall we say of that? In the midst of such trumpeting on the part of the general press it seems fitting to pay a greater compliment by using the simplest language. Indeed it gives us the sincerest pleasure to see so fine a pioneer receive credit in his own time for a little of the much that he has accomplished. Whatever Cody has gained he has deserved, for none can deny that he has worked hard, and none can deny that his machine went through with the flag flying. It is a triumph of which more than Cody may feel proud, for the Cody biplane is an original British machine, having from the first been different to all others. No one who followed our technical

commentary on the course of the trials could have failed to see that the Cody must essentially win some high reward, provided that the scope of its purpose appealed to the military point of view. It has great lifting power, and it could easily be made to carry a gun, which things alone, we should think, are sufficient to accentuate the merit of its performances under the various heads of the competition.

And surely this victory of Cody's is a lesson to all hesitating pioneers, for Cody is not "Cody and Co.," be it remembered, but just one man filled with inexhaustible energy, a ceaseless worker with hand and brain. Now that the Cody biplane has received military recognition there is a unique opportunity for some big firm to acquire a ready-made stake in the aeronautical industry by taking up the rights to manufacture.

Finally, and in firm pursuance of our desire to do honour without reference to honours, may we not say a word in encouragement of those who, for one reason or another, failed to go through with the event. Of the Martin-Handasyde, for instance, which is a most beautifully designed and built monoplane of the large wing type, but was placed out of action solely because of the persistent failure of its Chenu engine; of the Coventry Ordnance biplanes, in the further development of which Mr. Manning certainly deserves encouragement, one of which was likewise totally disabled through the failure of its Chenu engine. The Vickers, owing to a combination of unfortunate circumstances, failed to do itself justice, for it was certainly flying better at Brooklands than ever it did at Salisbury Plain. The Handley Page was not ready, and an untimely landing down wind broke a wing when it did begin to fly; nevertheless the Handley Page monoplane with its crescent wings is distinctly among the machines that we hope to see evolved to a successful issue. Yet another British constructor of great promise, who can scarcely look back on the trials with unmitigated kindness, is Mr. Howard Flanders, whose original and well-executed design of biplane for three weeks lacked any vestige of its long-promised engine. The Breguet biplane, another distinctive type about which it would have been most useful to have had definite information, appeared to be unable to get its engine into action, notwithstanding the ceaseless efforts of the most determined French mechanic we have ever seen. Of the British-built Pigott biplane it is impossible to say more than that it must be the smallest machine in the world and that it was nicely built; it was only finished just before the end of the trials, and a mishap to one of the wings while "taxying" all too soon put it out of action. To the Mersey, of sad and regrettable memory, there is due this credit, that it was the only monoplane with the propeller behind, and in that regard was exempt from a criticism that has often been levelled against monoplanes in general by those who have regarded their use solely from the military standpoint.

ARMY AEROPLANE COMPETITION AWARDS.

ALTHOUGH we were able to give the awards in the Army Aeroplane Competition in the greater part of the edition of last week's FLIGHT, some of the earlier copies had to be printed without them. Therefore we reproduce them in full below:—

The Army Council, on the recommendation of the Judges' Committee, have awarded the following prizes in connection with the Military Aeroplane Competition.

Prizes open to the world:—

First prize, £4,000, to S. F. Cody, or Cody biplane (British).

Second prize, £2,000, to A. Deperdussin, for the Deperdussin monoplane (French), No. 26.

Prizes open to British subjects, for aeroplanes manufactured wholly (except the engine) in the United Kingdom:—

First Prize, £1,000, to S. F. Cody.

As no other British aeroplane completed all the tests, the two second prizes will be withheld, but the three third prizes of £500 each are awarded to:

British Deperdussin Co. for Dep. No. 21.

British and Colonial Co. for Bristol monoplane No. 14.

British and Colonial Co. for Bristol monoplane No. 15.

The following entrants, whose aeroplanes were submitted to all the tests, will receive £100 in respect of each aeroplane:—

M. Ducrocq, for Hanriot monoplanes (French) Nos. 1 and 2.

Aircraft Co., for Maurice Farman biplane (French) No. 22.

L. Blériot, for Blériot monoplanes (French) Nos. 4 and 5.

A. V. Roe, for Avro biplane (British) No. 7.

CODY AND HIS "CATHEDRAL."



The centre portion of the Cody biplane which won the £5,000 in prizes in the Military Trials.

RECOGNITION has come to Cody at last, after many years of hard, up-hill work; seldom has success been better earned than his. In spite of apparently insurmountable obstacles, but with the enthusiasm of the true pioneer, he has persistently toiled to overcome an endless succession of difficulties. Cody's success is all the more creditable because his work is so entirely original; original, yet not freakish. What he does is his own thought, and mostly his own handiwork too. From the first he determined to build a big machine; a natural impulse, for there is nothing small about Cody, even his compass looks twice the size of what one generally imagines to be suitable for aeroplane work, and when, incidentally, I asked him the time, I was not in the least surprised to see him pull out a watch reminiscent of the days of our grandfathers.

As in his earlier machine, there is a free simplicity about the constructive detail that appeals mightily to the common sense, though it may at times offend the susceptibilities of the standardised engineering mind. Similarly too, there remains that great, perhaps the greatest, feature of Cody design, to wit, the divided elevator, which is worked in unison with the warping of the main planes for the maintenance of lateral balance. Steering is accomplished by twin rudders, independently mounted on twin outriggers of bamboo. There is no rear elevator, but fixed transversely to each rudder is a

very small horizontal damper plane. The control differs from that of most other machines in that the steering is effected by a horizontal wheel arranged as in a motor car, except that the steering column itself has a universally pivoted support for the purpose of warping and elevating. In the Cody machine the feet are, therefore, left free from the control, and very naturally Cody has of late adopted the pedal accelerator, which makes the driving of the Cody "bus" still more like the driving of a car.

In the construction of the machine silver spruce is used for the spars and struts, American hickory for the landing chassis and engine bearers, and stout bamboo poles bound with tape for the outriggers that carry the elevator and rudders. Pegamoid is used for covering the planes, and I understand that the fabric has withstood three years' wear and tear.

The landing chassis is practically the same as that of the earlier machine, and includes a central skid that carries a pair of small buffer wheels in front and a kangaroo-like tail of laminated wood behind. An ingenious dodge on this tail, which gave Cody much pleasure and some profit in the trials, is a length of chain (rather like a Parson's non-skid for a motor car tyre) that could be drawn up out of the way by a string. On landing, the string was released so that the vibration of the tail could shake the chain rings that encircled it down into contact with the ground, where they acted as very effective brakes. Two wheels, mounted on vertical telescopic tubes with powerful coil spring shock absorbers, support the weight of the machine at starting, while in the air these same springs pull upon the main lift wires under the lower planes. The wheel track is only 3 ft. 6 in., and small wheels are, therefore, fitted as fenders to the wing tips. Indeed, these latter may be regarded as part and parcel of the chassis arrangement, as they come frequently into use.

The pilot's seat is now partly covered in, and immediately behind it is one passenger seat, from which a beginner first obtains tuition by handling an extension of the control lever over the pilot's shoulder. Subsequently the positions are reversed. On either side of the pilot's seat, but outside the nacelle, are two other seats, the position of which gives an absolutely unrivalled opportunity for observation, but is not everybody's choice in a "joy ride" all the same. From the purely patriotic view one cannot but lament the fact that Cody was unable to secure a British engine to meet his requirements, not that there is anything but praise for the Austro-Daimler, which is unique of its kind and behaved splendidly, but I hope to see the Cody absolutely all British-built yet.

C. M. P.

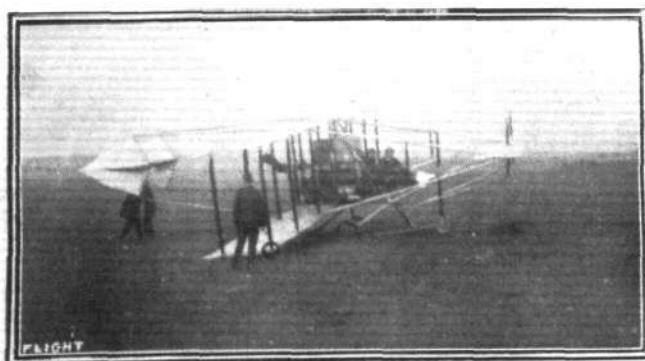
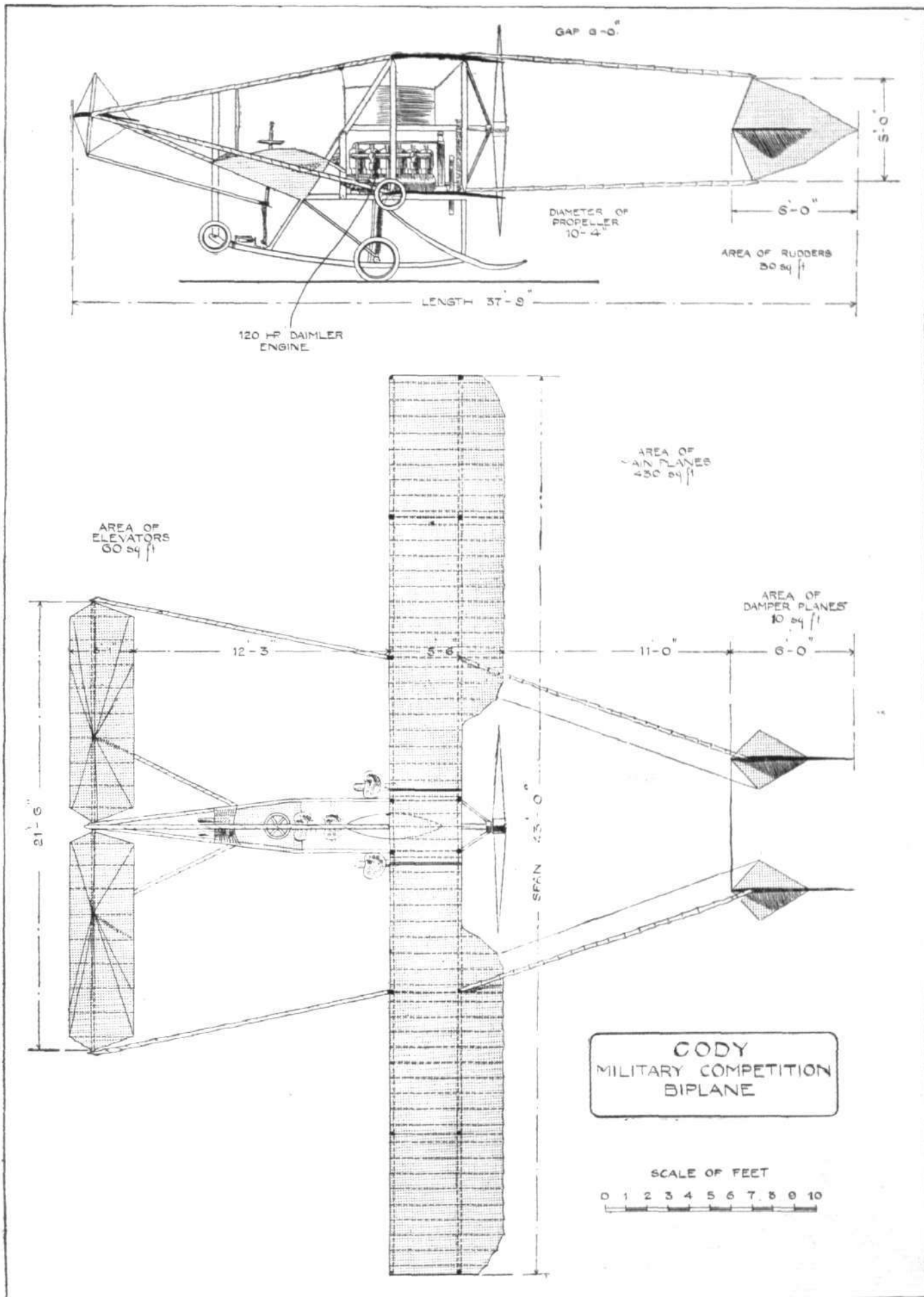


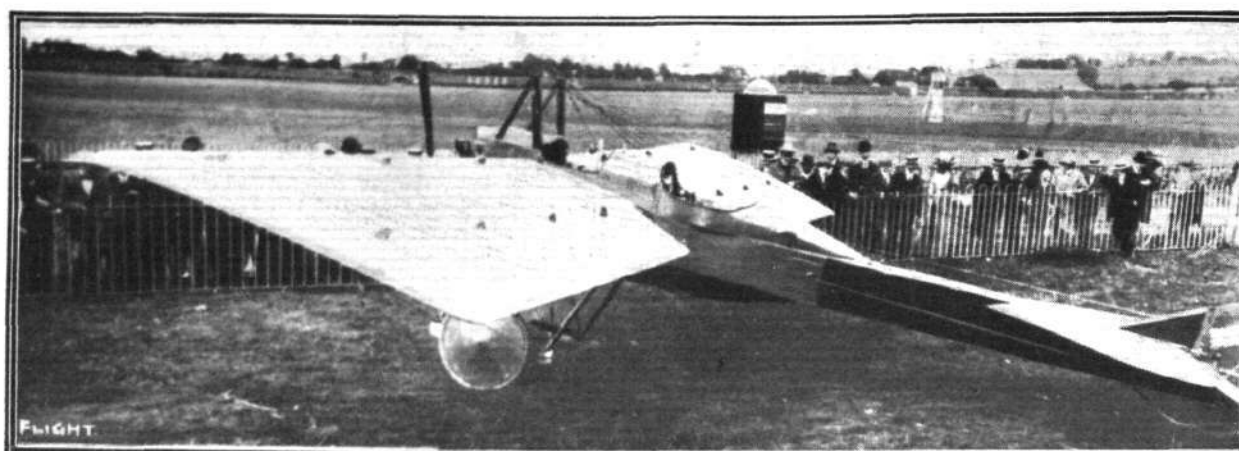
Photo by G. M. Part.

The Cody biplane about to start on the official test in the Military Aeroplane Trials.



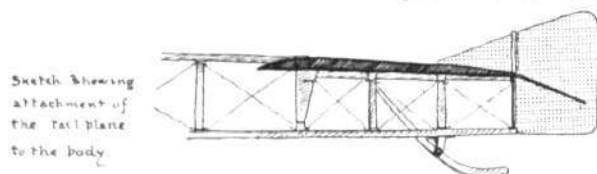
PLAN AND ELEVATION OF THE CODY BIPLANE, which won the first prize open to the world, and also the first prize open to British machines only, in the Military Aeroplane Trials. The above drawing represents the machine exactly as it finished the trials.

THE "DEP."



View of the British Deperdussin monoplane which secured a £500 prize in the Military Trials.

IN the familiar abbreviation by which the Deperdussin monoplanes are known throughout the British world of flight, there is a great amount of friendly appreciation of their good qualities. Down at Salisbury Plain, Prevost on the "Dep." was the man of the moment when, with the full support of Mr. Santoni's organisation, he pushed his machine through the whole of the tests in such a businesslike style that he finished days in advance of the others, and thereby caused the public at large, which gathered its information indiscriminately, to remark, "I hear a French machine has won all the prizes." And when the army "also flew," as someone with an unconscious humour once remarked of the persistent and fine per-



formances of the officers of the Royal Flying Corps, it was Capt. Hamilton on the "Dep." who did the lion's share of the "also."

The "Dep." monoplane, which is now made in England as well as in France, the works at Highgate being under the management of M. Koolhoven, is a machine of the utmost grace in appearance. Its design and construction leave nothing to be desired in their proportions and finish. The scale drawing, which accompanies this brief note on the second prize winner, shows the latter better than words, while the little sketch illustrating the fastening of the tail plane to the machine's backbone will serve as a characteristic example of the former remark. The backbone of the machine is surfaced from head to tail, and the tail plane itself is let in flush with

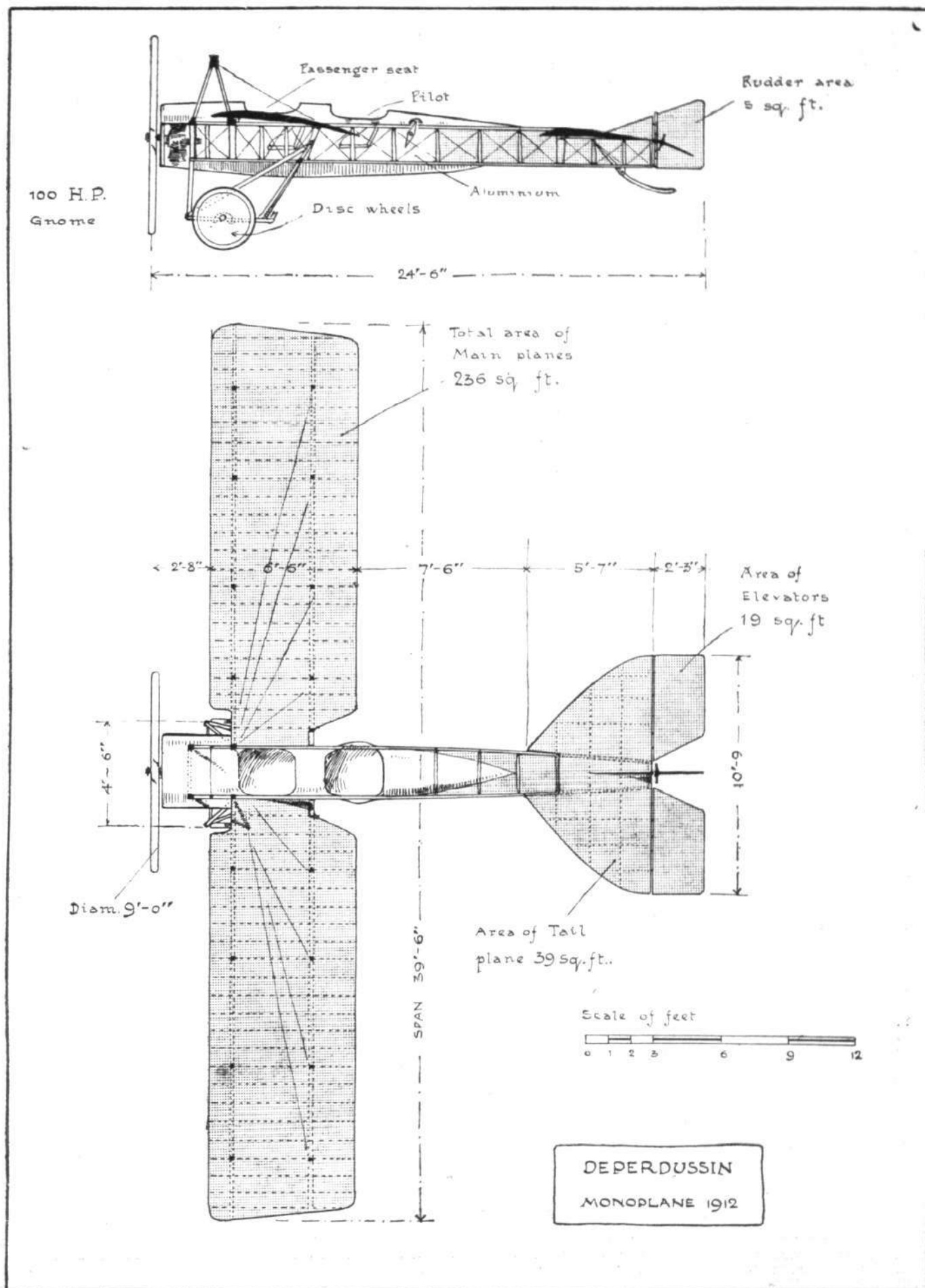
the upper surface of the rectangular girder, an arrangement that certainly adds to the smooth finish of the whole. The "Dep." tail plane, moreover, is one of its most interesting features, being heavily cambered, of large area, and intended to carry its share of the weight. On the ground the position of the chassis wheels is such that the machine is extremely tail heavy, three men having to exert much force to lift it. In flight, of course, there would not be this disproportion in the balance, but, in any case, before rising the tail plane *can* elevator have to lift the tail into its flying attitude. Incidentally, the weight on the tail skid when landing causes that member to serve effectively as a brake, for on soft turf the pressure is sufficient to gouge out quite a deep rut.

The undercarriage is an interesting example of, A frame construction, in which the side panels are braced by diagonal struts that in some machines are extended to form "hockey stick" skids under the propeller. The wing spars are trussed above and below by six wires to each, a seventh wire being carried from the back of the undercarriage to the extremity of each front spar in order to provide, between them, for a lift-resisting component in a truly vertical plane. The presence of the chassis wheels, which are spanned by these wires, to some extent limits their position, but in any case the duplication of the wire in question makes for rigidity, by the triangular arrangement of the truss system.

The camber of the wings, although somewhat greater near the shoulder than elsewhere, is still well maintained at the tip, but although not very clear to see, it is probable that some degree of "wash-out" is obtained from a slight elevation of the rear wing-spar. That the wing itself does not flatten in flight, however, is obvious to anyone who watches the flying of these machines, the well-cambered profile of the wing-tip being quite a marked feature of them when seen in certain aspects.



The French Deperdussin monoplane which secured the second prize of £2,000 in the Military Trials.



PLAN AND ELEVATION OF THE DEPERDUSSIN MONOPLANE.—The above drawings were prepared at the Highgate works of the British company, and illustrate the British design. In the French design, the passenger sits behind the pilot, and the machine has a larger effective supporting surface.

FINAL NOTES ON THE MILITARY TRIALS.

By Our Technical Editor.

Aeroplane Constants.—Whether readers of FLIGHT have shared my own faith in the potential utility of X (weight per h.p. \times weight per sq. ft.) as an empirical rating factor indicative of the outstanding conditions of flight imposed by the design, I have my doubts, but the later developments presented last week, where X has now brought forth two new factors, x and ϵ , at least add to the interest of the situation. The footnote, under the big table last week, explained in a very condensed form, the evolution of these new factors, but it may be of some purpose to go into the matter somewhat more fully. Originally, X seemed to be a rather disappointing quantity, from the indefinite character of its basic dimensions:—

$$X = (\text{wt./h.p.}) (\text{wt./sq. ft.}) = (m/mle^{-1}) (m/l^2);$$

but, the recognition of the fact that experimental research has already defined the pressure per unit of area on a wing as a function of V^2 , entirely alters the situation so far as the dimensions of X are concerned. Thus, instead of the above, it is permissible, and indeed proper, to ignore the m.l.t. dimensions of loading and to write

$$X = (m/mle^{-1}) (fV^2) = (fV^{-1}) (fV^2) = fV.$$

So soon as it is seen that $kX = V$, a new interest is added to its significance, especially if there is any means of determining the constant k that will satisfy the expression. And, here, it appears to me, that the proper field of investigation is related to the elementary aerodynamics of the subject, which is discussed on p. 68 *et seq.* of "Principles of Flight." Of the component parts of the factor X , weight per h.p. is presumably related, on a power basis, to an expression in the order of mv , while in a similar way if the energy expended on supporting the loading of the wings is represented by the power in the deflected air stratum, then pounds per

sq. ft. is related to an expression in the order of $5mv^2$. The combination of these two quantities in the manner indicated above leaves us with an expression in the order of $5v$, whence it would appear probable that, if the above reasoning is at all correct, the required constant $k = .5$. If this is true, then $X \div 2$ gives the flight speed appropriate to the design of the machine, and values of $.5X$ appear in the table under the column x .

Similarly, having arrived at the flight speed required, the power necessary to maintain it can be calculated on the assumption of a gliding angle of say 1 in 6, and, by equating the power thus ascertained to the actual engine power available, a ratio is established giving the efficiency anticipated, values for which also appear in the table under the column ϵ .

Right or wrong, there is sufficient importance in the assumption to warrant investigation, and it is, at any rate, interesting to compare the figures so obtained with those actually demonstrated in the trials. In the first place, if x is divided by the actual flight speed, a constant in the order of 2 results, the range of variation from the exact value being, of course, considerable in the extreme cases, due to the absence of similarity in the design and performance. Conversely, of course, the values of x approximate the flight speeds attained by several of the machines. Again, those machines that realised their anticipated efficiency are precisely those that have all along so obviously performed with all-round excellence, that is to say, have demonstrated a good high speed and a good climbing power, and yet have not given rise to any suggestion that they are of abnormal proportions.

For the sake of convenience, the tables this week are summarised under different headings, the machines being retained in uniform order so as to facilitate rapid reference, thus:—

DIMENSIONS.

	L.	l.	t.	A.	
	"	"	"		L=span, measured across wing-tips, and including body space. In a biplane the max. span is given.
Hanriot 1	41 9	7 6	33 -	300	l=mean chord.
Hanriot 2	41 9	7 6	33 -	300	t=tail area sq. ft.
Blériot Tan.	31 6	7 4	31 +	260	+ =lifting tail.
Blériot Soc.	36 7	8 6		310	- =non-lifting tail.
Avro	35 3	4 9	20 -	335	A=effective area (sq. ft.) for supporting the load.
Bristol Mon. 14	39 0	6 1	28 -	210	
Bristol Mon. 15	39 0	6 1	28 -	210	
British Dep.	41 0	7 0	54 +	307	
M. Farman	51 8	4 7	130 +	666	
Fr. Dep.	41 0	7 0	54 +	307	
Cody	43 0	5 7	65*	485	

* Elevator.

In the matter of span, the biplanes stand at each end of the scale, the smallest being the Avro, the largest being the Maurice Farman,

WEIGHTS.

	w.	W.	W ₁ .	W ₂ .	X.
Hanriot 1	1166	1921	24.0	6.4	153
Hanriot 2	1160	1898	23.7	6.34	151
Blériot Tan.	885	1499	25.0	5.77	147
Blériot Soc.	857	1481	24.7	4.8	118
Avro	1191	1762	27.2	5.28	144
Bristol Mon. 14	1144	1839	24.5	8.75	214
Bristol Mon. 15	1159	1871	25.0	8.9	222
British Dep. 21	1226	1930*	24.2	6.3	152
M. Farman	1318	1931	26.8	2.9	78
Fr. Dep.	1184	1868	23.4	6.1	143
Cody	1948	2680	23.8	5.55	131

* Approximation.

w =weight in lbs. empty. $X = W_1 \times W_2$ =an empirical rating factor for determining the flight-speed proper to the design and anticipated efficiency.

All machines that completed the trials were weighed empty and the tank capacities having been ascertained by measurement, the weights in flying order, as given in the accompanying table, may be regarded as very fairly accurate. They are, at any rate, far more so than were most of the makers' estimates. The heaviest machine is

the Cody and the lightest the Blériot. It is interesting to note that the Blériot sociable weighs less than the Blériot tandem, which is the smaller machine. In flying order for 4½ hours under trial conditions, the Cody weighed over a ton.

In the next column are given the weights divided by the effective engine power, which represent the dead load on the engine, so to speak. The limits here are fairly narrow, ranging only from 23.4 in the French Dep. to 27.2 in the Avro. Comparative uniformity in this respect is instructive. On the other hand, there is a fairly wide range in the loading of the wings, the Farman being very lightly loaded to less than 3 lb. per square foot, and the Bristol monoplane being very heavily loaded to nearly 9 lb. per square foot.

There is a correspondingly wide range in the value of the factor X , which represents the product of weight per h.p. by weight per square foot, and may be likened to multiplying the weight per h.p. by the gear ratio in a motor car, for in so far as the lift per square foot on the wings only reaches the required value for the support of the machine at a certain speed, the loading has indeed something of the characteristics of a gear. Although, in my original arguments, X itself was used as a characteristic of design, subsequent developments, as explained above, have caused the two factors x and ϵ to be a more direct and more useful basis in this connection.

EFFICIENCY (MACHINE AS A WHOLE).

The efficiency of the machines, meaning the ratio of the power represented by the obvious performance, to the power known to be available in the engine, can be considered under two heads. The efficiency of the machine as a whole is the true efficiency from the designer's point of view, who desires to check the accuracy of his calculations and the value of his design generally. It takes into

account the weight of the machine, as well as the weight carried, and it is based on the actual gliding angle as well as the actual flight speed.

In the first column of the accompanying table are the values for ϵ , derived from the factor x as already explained. These values are the anticipated efficiencies; in the column E_1 are the efficiencies



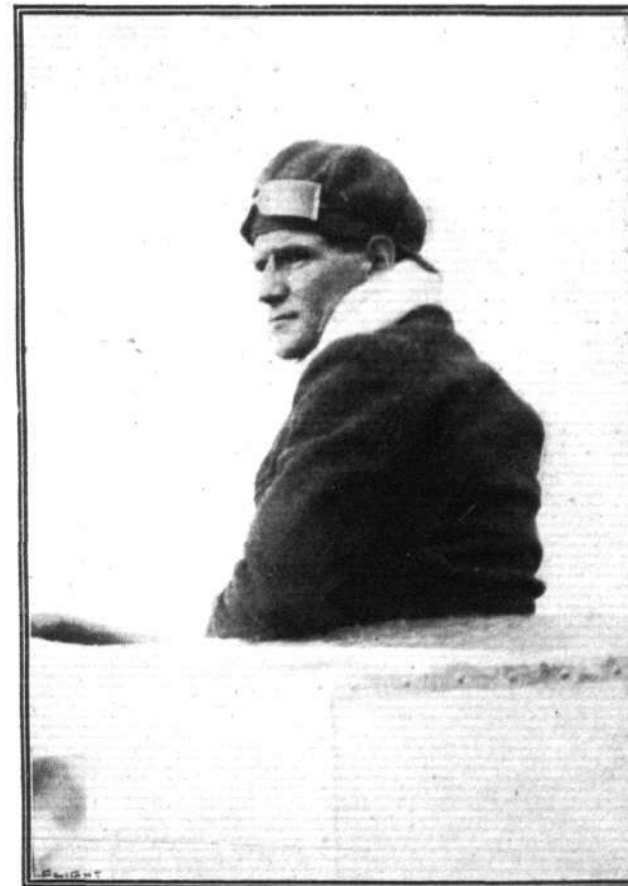
Mr. S. F. Cody, whose biplane secured the first prize, open to the world, in the Military Trials, and the first of the prizes open to British subjects.



M. Prevost, who piloted the French Deperdussin monoplane which secured the second prize, open to the world, in the Military Aeroplane Trials.



M. Coanda, the designer of the Bristol monoplane, which did so well in the various tests in the British Military Aeroplane Trials.



Mr. Busteed, the pilot of the Bristol monoplane No. 14, which obtained one of the £500 third prizes for British aeroplanes in the Military Trials.

	ϵ .	E_1 .	e_1 .	E_2 .	ϵ =anticipated efficiency calculated from X.
Hanriot 1 ...	82	73	70	99	E_1 =efficiency actually attained, calculated from TV max. : HP.
Hanriot 2 ...	79	81	77	105	e_1 =efficiency on a fuel basis, from TV max. : P + O,
Blériot Tan. ...	82	72	77	90	which assumes 1 pint of petrol and oil per hour = 1 h.p.
Blériot Soc. ...	65	73	68	90	E_2 =efficiency if the climbing power is still in reserve at the maximum flight speed, i.e., TV max. + H.p. : HP.
Avro ...	87	69	123	77	
Bristol Mon. 14	111	81	78	96	
Bristol Mon. 15	123	—	—	—	
British Dep. 21	80	75	64	96	
M. Farman ...	46	58	68	75	
Fr. Dep. ...	74	79	86	103	
Cody ...	65	69	110	89	

No. 15. Gliding angle unknown.

actually obtained, as demonstrated by multiplying the gliding resistance by the maximum flight speed. By how much the resistance at maximum speed exceeds the resistance at gliding speed is unknown, but it is certainly not less than that resistance, consequently E_1 is an understatement rather than otherwise of the true value.

The final column E_2 is obtained by adding the power available for climbing, on the assumption that it is still available when the machine is flying its fastest. The object of E_2 is to present a figure of merit for combined speed and climbing.

In the column e_1 the efficiency is placed on a fuel basis, instead of on an actual power basis, in order to put a premium on economy of fuel and oil consumption, as there is such a wide difference in this respect among aeroplane engines. Where machines like the Bristol, Hanriot and Dep. may be regarded as the standard of overall power efficiency, the economy of the Green engine places the Avro above all the others on a fuel basis, and the Cody with its 120 h.p. Austro-Daimler makes a very good second. In this estimate, oil has been added to petrol, on the assumption that they are of equal importance, and for the sake of convenience in reckoning, one pint of fuel plus oil per hour is assumed to be equivalent to one h.p.

It is instructive to observe that the biplanes as a class are not as efficient in their overall design as the monoplanes as a class. It may be remembered that, when first discussing the factor X, I suggested that the limiting value for biplanes might be different from the limiting value for monoplanes. The equivalent question now is whether it is safe to design for as high an efficiency in a biplane as in a monoplane. In a monoplane it is apparently reasonable to anticipate 80 per cent. efficiency or perhaps 82 per cent. In a biplane it looks as if 70 per cent. is about the limit. Among the monoplanes, it is interesting to observe how the Avro has anticipated lightly too much, which was diagnosed last week as being due to

having an engine that was not quite powerful enough. The Bristol monoplanes, which were also over designed, primarily need a reduction in dead weight, for reasons also explained last week.

Among the biplanes, the Farman designs for a very low efficiency which it easily exceeds, but the Cody in designing for 65 per cent. efficiency plays up to it just as the best monoplanes do to their own higher value, and the result has been a performance which for all round excellence has been unexcelled.

Adding fuel and oil together, the cost of operation ranges from a little over 1½d. a mile (Avro) to just over 4d. a mile, the Cody costing only a little over 2½d. a mile. Now these are very remarkable figures. It has probably not occurred to many people that the cost of operating an aeroplane under this head is anything like so low. Moreover, let us for a moment assume that the aeroplane is on an equality with the motor car in the matter of safety and convenience. What else is there that stands as a charge against the aeroplane that does not equally stand as a charge against the car? The garage and the hangar cancel one another, for example. The natural depreciation of fittings and fabric is, let us say, comparable with that taking place in coachwork and upholstery. The aeroplane has tyres, but what are they? Certainly not to be compared in their cost of upkeep, I hope, with those on a motor car. For its extravagance in going virtually up hill all the way, the aeroplane gives the user the compensation of no tyre bill! it is something, indeed, to be thankful for, and in truth, it just makes all the difference in the outlook of the aeroplane from the point of view of utility. True, the engine on an aeroplane is hard worked, but it is not subject to sudden acceleration, and also there is not transmission gear to speak of, nor are there any brakes. There is no reason why the cost price of an aeroplane should not be comparable with the cost price of the car, and with the main outstanding charge of operations already down to 1½d., it will be a wonderful thing if the aeroplane does not find an uncommonly useful niche in the world later on.

And, remember the speed; certainly the wind has to be reckoned with, but then the wind may be blowing either way. A machine that will already take you between 60 and 70 miles an hour for no more than it costs to travel first class by rail is not to be ignored in a community where time means money.

In the last column of the table, an attempt has been made to equalise the basis of comparison by introducing the factor of speed. The figures given are the cost per mile per hour for a journey of 100 miles at the fastest speed of the machine. Thus, the Avro travels 100 miles at 62 miles an hour at the rate of 2½d. per mile per hour. The Hanriot does the same journey at 75 miles an hour at a cost of 4½d. per mile per hour. The Maurice Farman at 55 miles an hour costs 5½d. per mile per hour and the big Cody travels for about 3½d. per mile per hour at 72 miles per hour, a very remarkable performance.

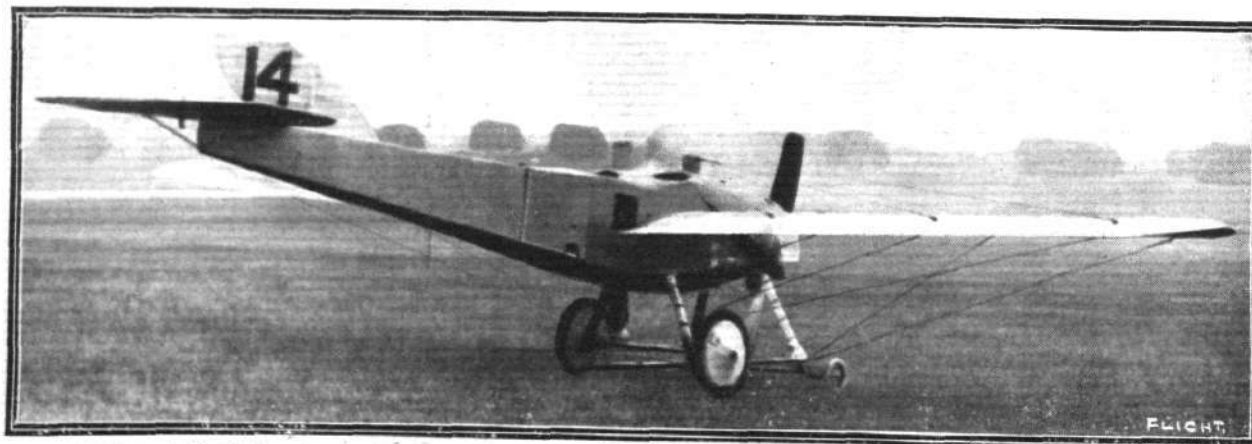
RANGE OF ACTION.

	P.	O.	O+P.	
	miles.	miles.		
Hanriot 1 ...	408	400	98	P=distance in miles that can be covered on one charge of petrol.
Hanriot 2 ...	361	406	112	O=ditto for oil.
Blériot Tan. ...	305	295	97	P+O=relative distance that the fuel lasts as compared with the oil.
Blériot Soc. ...	252	340	135	
Avro ...	345	840	242	
Bristol Mon. 14 ...	343	328	95	
Bristol Mon. 15 ...	421	420	100	
British Dep. 21 ...	320	590	184	
M. Farman ...	276	266	96	
Fr. Dep. ...	315	379	122	
Cody ...	336	740	222	

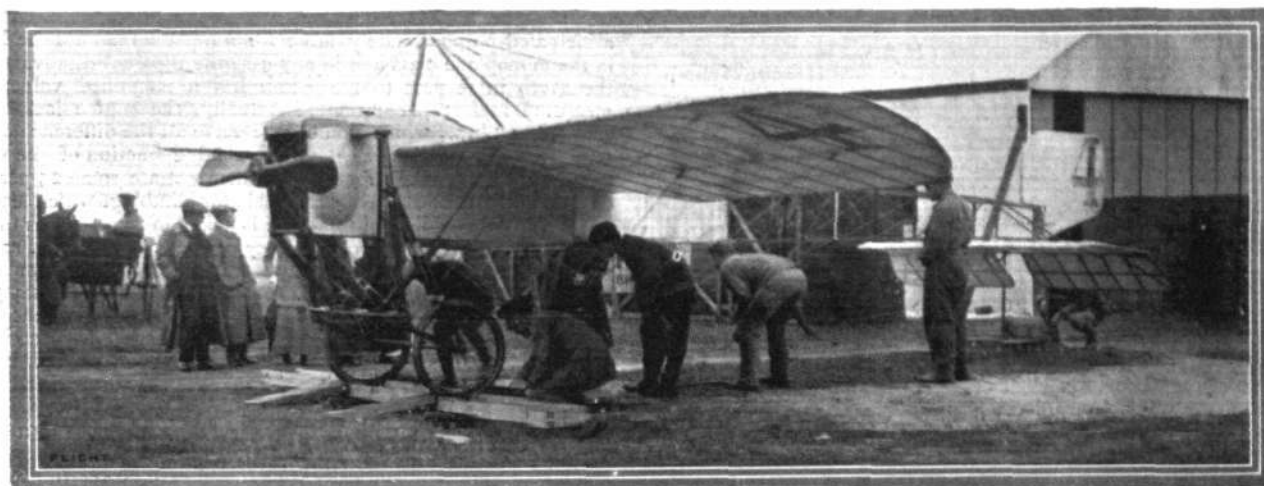
In an aeroplane it is essential that one should have a wide range action, and particularly will this be necessary in military, and

more especially in naval, operations. The machines in the trials have a range of about 250 miles (Blériot) to 420 (Bristol), but from a casual glance at the figures one would say that the modern aeroplane under the trial conditions is good for 300 miles at least.

A little point in design that is worthy of closer attention on the part of manufacturers is the fact that the oil consumption would in some cases cause the supply to run out before the petrol tank was empty. It is obvious that the relative capacities of the tanks on a mileage basis should give a surplus of oil. In the Cody and the Avro, the machines could do an outward and a return journey by merely filling up with fuel at the turning point, but this double range is of less importance on these machines that use ordinary lubricant than in the case of the machines fitted with Gnome engines, where the necessity of using castor oil makes it all the more imperative to carry an adequate supply. The ratio of oil to petrol is shown in the last column.



One of the Bristol monoplanes which secured a third prize of £500 in the Military Trials.



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WEIGHING THE MACHINES IN THE ARMY TESTS.—The aeroplane undergoing the operation is No. 4, a Blériot.

SPEEDS.

	α	V max.	V min.	R	Vg.
Hanriot 1	76	75.2	59.9	25.6	61
Hanriot 2	75	75.4	66.6	13.2	68
Blériot Tan.	73	60.8	51.0	17.5	
Blériot Soc.	59	58.0	40.0	47.3	52
Avro	72	61.8	49.3	25.4	
Bristol Mon. 14	107	70.5	68.3	3.2	64
Bristol Mon. 15	111	72.9	58.1	26.0	
British Dep. 21	75	68.2	54.6	26.0	
M. Farman	39	55.2	37.4	47.6	38
French Dep.	71	69.1	59.0	17.1	62
Cody	65	72.4	48.5	49.4	59

$\alpha = X + 2$ = speed proper to the design.

V max. = mean fastest speed acquired.

V min. = mean slowest speed acquired.

Vg. = gliding speed.

The first column in the table gives the speed appropriate to the design, as obtained by dividing X by 2, the explanation of this having already been given. The second column is the actual maximum flight speed attained. It may be said that four machines approximated closely to their proper flight speeds, if α does in fact represent the proper speed. The two Bristol monoplanes ought, according to this argument, to fly at over 100 m.p.h. in order to be in

harmony with their present weight and wing surface. The speed actually attained by these machines is already high for the power available, as is indicated elsewhere by the fact that they show an efficiency in the order of 80 per cent. The high value of α , therefore, indicates an absence of the reserve for climbing and acceleration that ought to accompany the performance. The natural speed of the Farman is virtually identical with its gliding speed, which is given in the last column, and the increase represented by the maximum speed results from the use of the large amount of reserve power, the machine having been designed for a low anticipated efficiency, as is indicated elsewhere. The same remark applies to the Cody.

The minimum speed is given in the next column and the range is expressed as a percentage increase in the third column. The Bristol monoplane 15 and the Hanriot monoplane 1 obtained their high range by the dexterity of the pilots, who switched off the ignition intermittently. The performance of the Blériot Sociable, however, was produced by throttling. Between 17 and 20 per cent. variation seems to be a fair value to expect from monoplanes.

The determining factor in speed range, apparently, is the factor of anticipated efficiency, the lower values giving higher speed ranges; it will be found that the Farman, the Cody and the Blériot Sociable, which have a marked superiority in the matter of speed range are likewise those with the lowest values of ϵ .



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WEIGHING THE PILOTS IN THE ARMY TESTS.—Mr. S. F. Cody undergoing the ordeal. On the extreme right is Sir George White, the founder of the British and Colonial Aeroplane Co., Ltd., the constructors of the famous Bristol machines.

CLIMBING.

	H.	Hp.	H%.	
Hanriot 1 ...	365	21'2	26'5	H = rate of climb
Hanriot 2 ...	333	19'1	24'0	in ft./min. for
Blériot Tan. ...	250	11'3	17'7	1,000 ft.
Blériot Soc. ...	236	10'6	16'6	Hp = power ex-
Avro ...	105	5'6	8'6	pended on
Bristol Mon. 14 ...	200	11'1	14'9	climb alone.
Bristol Mon. 15 ...	218	12'4	16'6	H% = ratio of
British Dep. 21 ...	267	26'5	20'6	Hp. to HP.
M. Farman ...	207	12'1	16'8	
French Dep. ...	333	18'8	23'5	
Cody ...	288	23'4	19'5	

The rates of climbing are given in the first column in feet per minute, the minimum required by the rules of the competition being 200 feet per minute for the first 1,000 feet of the climb. The Avro failed completely to obtain this value due, as is shown elsewhere, to the overloading of its engine, which already has as much as it can do to fly the machine. It will be remembered that this was already a suspicion when I first discussed the significance of X, but it is still more apparent from the subsequent evolution of α and ϵ . It is important to observe, however, that the Bristol monoplanes did attain the required minimum of 200 ft. per minute, although their value of X and anticipated efficiency is in excess of that of the Avro. As a matter of fact, however, it is not unlikely that the Avro

anticipated proportionately more for a biplane than did the Bristol in the monoplane class and in any case the apparent disadvantage of the Avro in respect to the climb has a magnified value when measured in feet per minute. Actually, the engine lacked only about 6 or 7 h.p., which would have made all the difference, for the power expended in climbing is not a large fraction of the whole. The Hanriots and the French Dep. demonstrate some 25 per cent. of the total power as being available for climbing, which leads me to think that an ability of this order is common to machines that are designed for an anticipated efficiency of about 80 per cent. and can actually achieve as much in practice. In other words it would have been fair if the monoplanes had been required to climb at say 300 ft. a minute instead of 200 ft. a minute; the accomplishment would still have been incidental to the design, if what I suspect in this matter is true. Those who have studied "Principles of Flight" and the characteristic curve for aeroplanes, which was first brought before my notice by Mr. Mervyn O'Gorman and about which articles were written in FLIGHT, January 13th, 1912, and March 23rd, 1912, will recollect that the climbing power of a machine results automatically from the reserve power indicated by the space between two curves representing power available and power required. These graphs curve in opposite directions and intersect at each end of the speed range, where the power required and the power available are equal to one another and leave no reserve for climbing.

EFFICIENCY (USEFUL LOAD CARRIED).

	V	V	V+H	V+H
	HP.	F	HP.	F
Hanriot 1 ...	94	90	98	94
Hanriot 2 ...	94	88	98	92
Blériot Tan. ...	102	108	106	109
Blériot Soc. ...	100	92	102	96
Avro ...	92	166	97	175
Bristol Mon. 14 ...	94	91	97	93
Bristol Mon. 15 ...	97	107	100	110
Brit. Dep. 21 ...	85	73	89	76
M. Farman ...	76	89	79	92
Fr. Dep. ...	82	93	90	97
Cody ...	60	96	63	100

V/HP. = Efficiency at high speed on a basis of engine power.

V/F = Efficiency at high speed on basis of petrol + oil.

V+H/HP. = Efficiency when climbing power is added to power at full speed: basis of engine power.

V+H/F = Ditto: basis of petrol + oil.

V = Max. flight speed.

HP. = Effective engine power.

H = '01 of the rate of climbing.

F = petrol + oil in pints per hour.

When useful load becomes the basis of the efficiency calculation, it is not unnatural that it should change the comparative order of the results. Its most marked effect is to bring the Blériot machine into prominence, the reason being, presumably, that they are the lightest machines in themselves and that the useful load therefore represents a higher proportion of the total weight in flight. The Avro also comes to the fore under this heading, and in a still more marked way when fuel consumption is substituted for engine-power. The Green engine with its 90 lb. per square inch compression instead of the 45

or so which obtains ordinarily in the Gnome engine, is very economical both in petrol and in oil consumption.

In the Cody, where the useful load is such a small fraction of the total load in flight, the efficiency on a power basis is, not unnaturally, low, but all the more credit is therefore due to this machine for attaining third place in the list, when fuel consumption is substituted for power. If machines with large engines, like the Cody with the Austro-Daimler, are to be extensively used, it is most important that they should not be uneconomical when they are flying light, and the fact that the Cody demonstrates a 96 per cent. efficiency on a fuel basis with an engine that only allows it to have a 60 per cent. efficiency on a power basis, is, to my mind, one of the most creditable features of its performance.

It is necessary to point out in respect to this table that a series of approximations have been made in order to save labour in calculation.

It has been assumed that one pint of petrol plus oil per hour equals one horse-power.

It has also been assumed that every machine flies against a resistance of 375 lbs. It is immaterial what figure is taken as the basis, and the advantage of 375 is that it causes the numerical value of the actual flight speed to be a direct expression of the power expended, i.e., $V = H.P.$ The results in this table are, in any case, only relative.

In connection with the climb, it has been assumed that the useful load lifted is 330 lbs., which, at the rate of 100 ft. a minute equals 1 h.p. Thus the actual rate of ascent in feet per minute divided by 100 becomes an expression for the horse power credited to the machine while climbing, i.e., '01 H = hp.

In the third and fourth columns of the table, this climbing power has been added to the power credited to the flight speed, but there is no marked change in the relative merits of the machines.

PETROL CONSUMPTION.

Machine.	Engine.	h.p.	g.h.	m.h.	t.m.g.
Hanriot 1 ...	100-h.p. Gnome ...	80	8'0	9'6	8'16
Hanriot 2 ...	100-h.p. Gnome ...	80	8'6	8'8	7'5
Blériot Tan. ...	70-h.p. Gnome ...	60	5'4	11'3	7'6
Blériot Soc. ...	70-h.p. Gnome ...	60	6'3	9'3	5'5
Avro ...	60-h.p. Green ...	65	4'0	15'0	11'9
Bristol Mon. 14 ...	80-h.p. Gnome ...	75	8'0	8'8	7'2
Bristol Mon. 15 ...	80-h.p. Gnome ...	75	7'0	10'4	8'6
British Dep. 21 ...	100-h.p. Gnome ...	80	9'8	6'9	6'3
M. Farman ...	70-h.p. Renault ...	72	7'0	7'9	6'8
Fr. Dep. ...	100-h.p. Gnome ...	80	8'4	8'2	6'2
Cody ...	120-h.p. A.-D. ...	120	9'0	8'0	9'6

g.h. = gals. per hr. m.g. = miles per gal. t = tons.

In a motor car we speak always of petrol consumption as so many miles per gallon, and the same basis forms an instructive comparison for aeroplanes, seeing that the radius of action is limited by the "miles" in the tank. Having regard to the fact that an aeroplane

flies virtually up hill all the time on a one in six slope, it is remarkable that the Avro biplane should show 15 miles to the gallon, which is as good as any touring car fitted with an equally powerful engine. A few cars of 60-h.p. may do better than this under special conditions, but the average runs are certainly less economical, besides which, they do not maintain the same average speed. It will be observed, however, that the Avro is exceptional in this respect for the majority of machines travel only about 9 miles to the gallon. Even the big Cody, however, averages 8 miles to the gallon through the fuel economy of its Austro-Daimler engine.

On a basis of ton-miles to the gallon, the Avro and the Cody again score heavily, but of course, the actual figures in this column are far below the average values for commercial vehicle work, where 55 ton-miles to the gallon might be considered as a fair performance. Thus, as commercial vehicles of aerial transport, aeroplanes are heavily handicapped on the basis of freight pure and simple. There is no commercial vehicle, however, that takes its load between 60 and 70 miles an hour.

OIL CONSUMPTION.

Having regard to the importance of being able to carry all supplies necessary for an intended journey on board the machine

from the commencement of the flight, oil consumption becomes as important as petrol consumption and even more so in some cases,

where special lubricant that cannot be obtained everywhere is required. The engines in the trials ranged in their oil consumption from less than half-a-gallon per hour, Cody and Avro, to nearly two and a-half gallons an hour on the Hanriot with the 100-h.p. Gnome. The miles per gallon are as few as 33 and as many as 172, which is not more than a fourth as much as most people expect from their motor cars nowadays. The ratio of petrol to oil used in a motor car engine is in the order of 25 to 1; in the aeroplane engines the best value is 21.4 to 1 (Cody) and the least 3.1 to 1.

When petrol is added to oil, a startling effect is produced by the economy of the 60-h.p. Green on the Avro, which consumed no more than half what is required by most of the other machines. The Cody, despite its big engine, appears actually as economical as the others, even when compared on the same basis as the other machines that have engines of far less power.

			g.h.	m.g.	P:O	P+O
Hanriot 1	...	100-h.p. Gnome	2.4	33	3.3	10.4
Hanriot 2	...	100-h.p. Gnome	2.1	36	4.2	10.7
Blériot Tan.	...	70-h.p. Gnome	1.7	36	3.1	7.1
Blériot Soc.	...	70-h.p. Gnome	1.7	36	3.7	8.0
Avro	...	60-h.p. Green	.5	120	8.1	4.5
Bristol Mon. 14	...	80-h.p. Gnome	1.7	41	4.7	9.7
Bristol Mon. 15	...	80-h.p. Gnome	1.5	48	4.6	8.5
British Dep. 21	...	100-h.p. Gnome	1.8	38	5.5	11.6
M. Farman	...	70-h.p. Renault	.73	76	9.7	7.7
French Dep.	...	100-h.p. Gnome	1.3	52	6.3	9.3
Cody	...	120-h.p. A.-D.	.42	172	21.4	9.4

g.h. = gallons per hour. m.g. = miles per gallon.
P:O = ratio of petrol to oil. P+O = petrol and oil per hour, gals.

COST OF FUEL.

	P.	O.	P+O	V.	P+O
	<i>a.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>
Hanriot 1 ...	1.88	1.64	3.52	75	4.7
Hanriot 2 ...	2.05	1.5	3.55	75	4.7
Blériot Tan. ...	1.59	1.5	3.09	61	5.0
Blériot Soc. ...	1.93	1.5	3.43	59	5.8
Avro ...	1.2	0.45	1.65	62	2.7
Bristol Mon. 14...	2.05	1.32	3.37	70	4.8
Bristol Mon. 15...	1.73	1.12	2.85	73	3.9
British Dep. 21 ...	2.59	1.42	4.01	68	5.9
M. Farman ...	2.38	0.71	3.09	55	5.6
Fr. Dep.	2.2	1.04	3.24	69	4.7
Cody	2.25	0.31	2.56	72	3.6

P = Petrol, pence per mile at 1s. 6d. per gallon.
O = Oil, pence per mile at 4s. 6d. per gallon.

V = Approx. max. speed m.p.h.
P+O = Cost in relation to speed, pence per 100 miles per mile per hour.
V =

A natural consideration following upon the investigation of fuel and oil consumption is the cost of operation, which, for the purposes of the table, has been calculated on a basis of petrol at 1s. 6d. per gallon and oil at 4s. 6d. per gallon. It is immaterial that these prices can be reduced when supplies are taken in bulk; as they stand, they are sufficient to cover the expense of operation under this head as it would be incurred by the ordinary owner who merely has an aeroplane for his pleasure and uses it under the same conditions as he uses his motor car.

It will be observed that the cost for petrol alone ranges from 1½d. (Avro) to 2½d. (Dep.). Even the Cody only costs 2½d. a mile for petrol and only a third of a penny a mile for oil, which costs over 1½d. a mile on some of the machines fitted with the 100-h.p. Gnome engines.

GLIDING.

	G.	T.	Vg.	TVg.	
Hanriot 1	...	6.6	291	61	47.5
Hanriot 2	...	5.9	332	68	60.5
Blériot Tan.	...	5.6	267		
Blériot Soc.	...	5.3	280	52	38.8
Avro	...	6.5	270		
Bristol Mon. 14	...	6.5	284	64	48.5
Bristol Mon. 15	...				
British Dep. 21	...	6.2	328		
M. Farman	...	6.8	284	38	28.8
Fr. Dep.	...	5.4	346	62	57.5
Cody	...	6.2	432	59	68.0

G = gliding angle;
1 in —.
T = W ÷ G = resistance to gliding flight in lbs.
Vg = gliding speed.
TVg = power expended in gliding, h.p.

The conditions of the trials required a gliding angle of 1 in 6 on the part of all machines, that is to say, ascending to 1,000 ft. altitude they were to be capable of travelling 6,000 ft. measured horizontally before alighting. Most of the machines improved on this value, notably the Farman, which glides very slowly and in almost horizontal attitude. It is to the credit of many of the monoplanes that they also should have done so well, seeing that a good

gliding angle is evidence of a small head resistance and in that respect the figure of merit on what is often called the "efficiency" of the design.

By dividing the weight by the gliding angle, the resistance to gliding flight is obtained, and if one were dealing with a theoretically perfect aerofoil devoid of all superstructure this would also be the thrust required for horizontal flight at any speed, the aerofoil being assumed to adapt itself in respect to area automatically as the speed changes. The gliding speed is also an interesting figure, not hitherto available, so far as I know, with respect to any other machines. Indeed, there has never before been so much authenticated data relating to aeroplanes as has resulted from these trials, and it is a very natural desire to turn it to good account that has led to this lengthy and of necessity somewhat hurried analysis.

By multiplying the gliding resistance by the gliding speed, an expression for the power demonstrated in gliding flight is obtained in the last column, but I have made no particular use of this value elsewhere in the tables.

POWER.

	TVg.	TVmax.	Hp.	HP.	
Hanriot 1	...	47.5	58.5	21.2	80
Hanriot 2	...	60.5	64.9	19.1	80
Blériot Tan.	...		43.5	11.3	60
Blériot Soc.	...	38.8	44.0	10.6	60
Avro	...		44.9	5.6	65
Bristol Mon. 14	...	48.5	51.5	11.1	75
Bristol Mon. 15	...			12.4	75
British Dep. 21	...		59.7	26.5	80
M. Farman	...	28.8	42.3	12.1	72
Fr. Dep.	...	57.5	63.7	18.8	80
Cody	...	68.0	83.5	23.4	120

All powers are in h.p.
TVg = power expended on gliding.
TV max. = power expended on flying at the fastest speed, if resistance thereto is the same as when gliding.
Hp = power expended on climbing.

By multiplying the gliding resistance by the maximum flight speed, a figure for power is obtained that is certainly not less than the power expended on horizontal flight. It serves elsewhere as a basis for the calculation of efficiency. In the third column, the power expended on climbing is given, and this also is used elsewhere for further calculation.

The purpose of this small table is to arrange in a convenient manner for reference the powers represented by gliding, flying and climbing. Unfortunately, the gliding speed is not known in every case, so the required values are not quite complete. It is also interesting to compare these powers with the engine power actually available, which is given in the last column.

ENGINES.

	Petrol.	Oil.	Petrol + oil.	Petrol.	Petrol : oil.	
h.p.	g.h.	min.	max.	me.	min.	max.
100 Gnome	...	8.0	9.8	8.7	1.3	2.4
80 Gnome	...	7.0	8.0	7.5	1.5	1.7
70	...	5.4	6.3	5.9	1.7	1.7
120 A.-D.	...			9.0		.42
70 Renault	...			7.0		.73
60 Green	...			4.0		.5

g.h. = gall. per hour.
min. = minimum.
max. = maximum.
me. = mean.
h.p. = effective power of engine.

The performances of the engines are here summarised, the extreme values and mean values being given for each type. There were four 100-h.p. Gnoms that finished the trials and two of each other type of Gnome engine. The Austro-Daimler on the Cody, the Renault on

the Farman, and the Green on the Avro had no duplicates. The most economical engine on petrol consumption is the Green, which has an absolute consumption of 4 galls. an hour and a consumption of ½ gall. per h.p./hour. The big Austro-Daimler runs it close on fuel

efficiency. On petrol and oil combined, these two engines, which are the only water cooled engines in the trials, show a marked superiority.

Among the air cooled engines, the Renault on the Farman has been conspicuously reliable and has undoubtedly gained many friends at these trials, not only because of its performance on the Farman, but also for the manner in which it works on the Royal Aircraft Factory's BE 2. It runs smoothly, can be throttled down so that it can be started by the pilot from the ground, without anybody holding the machine, and develops its full rated power aloft. It is very reasonably economical in oil, and its petrol consumption is not out of the way for an engine of this type.

The Gnome rotary engines can never be criticised in anything but an exceedingly friendly spirit, for they have made flying what it is

to-day and they still remain the chief standby of the much harassed aeroplane constructor. Nevertheless, the day must come when designers will seek a higher degree of efficiency in their motors, as they have done in motor car engines, and one hopes that it will not always be necessary to use a liberal supply of castor oil in order to go flying. Gnome engines have been successful through good workmanship being applied to a sensible basic design, in which large cylinder capacity and low compression are the predominating features. As high compression is the high road to high efficiency, however, it naturally follows that one looks with special interest on the performances of other types of engine that are developing along these lines, albeit without any loss of appreciation of the incalculable service that the Gnome engines have rendered, and still continue to render, to the practice of aviation.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 3rd inst., when there were present:—Sir Charles D. Rose, Bart., M.P., in the Chair, Mr. Griffith Brewer, Mr. G. B. Cockburn, Col. H. C. L. Holden, C.B., F.R.S., Prof. A. K. Huntington, Mr. C. F. Pollock, and the Secretary.

New Members.—The following new members were elected:—Engineer-Lieut. Gerald W. S. Aldwell, R.N., Thomas S. Aparcar, Capt. Lionel L. Atherton, J. J. Beer, Eustace R. Berne, Capt. A. J. P. Coke, 22nd Cavalry F.F., Major C. D. Dawes, I.M.S., 39th Garhwal Rifles, Armand Deperdussin, Capt. P. T. Etherton, 39th Garhwal Rifles, Lieut.-Col. William F. Everett, Australian Light Horse, H. A. T. Fairbank, Lieut. E. C. Kenny, 39th Garhwal Rifles, Capt. W. G. S. Kenny, 39th Garhwal Rifles, Capt. J. T. H. Lane, 39th Garhwal Rifles, Capt. F. G. E. Lumb, 39th Garhwal Rifles, Major H. M. Mactier, 39th Garhwal Rifles, Capt. C. Mellor, R.E., Lieut. J. Morrogh-Bernard, 22nd Cavalry F.F., Lieut. J. H. Park, 22nd Cavalry F.F., Capt. A. W. Robertson-Glasgow, 39th Garhwal Rifles, Major A. B. Souther, 21st Cavalry F.F., Norman C. Spratt, Major G. H. Taylor, 39th Garhwal Rifles, Lieut. V. Wadham, and Lieut. F. F. Waldron, 19th Royal Hussars. Total membership to date, 1,430.

Aviators' Certificates.—The following aviators' certificates were granted:—

276. Staff-Sergeant William Thomas (Short Biplane, Central Flying School, Upavon).
277. Capt. Robert Harry Lucas Corder, R.A.M.C. (Bristol Biplane, Central Flying School, Upavon).
278. Richard Harold Barnwell (Bristol Biplane, Bristol School, Brooklands).
279. Capt. The Hon. Claude Brabazon (Bristol Biplane, Bristol School, Brooklands).
280. Lieut. Phillip Bennet Joubert de la Ferté, R.F.A. (Bristol Biplane, Bristol School, Brooklands).
281. Major Edward Bailey Ashmore, M.V.O., R.F.A. (Bristol Biplane, Bristol School, Brooklands).
282. Lieut. Claude Grenville Shephard Gould, R.G.A. (Bristol Biplane, Bristol School, Brooklands).
283. Lieut. P. H. L. Playfair, R.F.A. (Bristol Biplane, Bristol School, Brooklands).
284. Lieut. F. A. Wanklyn, R.F.A. (Bristol Biplane, Bristol School, Brooklands).
285. Walter Laurence Brock, Deperdussin Monoplane, Deperdussin School, Hendon). Subject to permission of Aero Club of America.
286. Thomas O'Connor, Engine-room Artificer, Royal Navy (Short Biplane, Central Flying School, Upavon).
287. Edouard Baumann (Deperdussin Monoplane and Caudron Biplane, Ewen School, Hendon). Subject to permission of Aero Club of Switzerland.

Aeronauts' Certificates.—The following Aeronauts' Certificates were granted:—

27. Sergeant B. Scovell, R.F.C.
 28. Sergeant A. Barnes, R.F.C.
- Airship Pilot Certificates.**—The following Airship Pilot Certificates were granted:—

13. Sergeant B. Scovell, R.F.C.
14. Sergeant A. Barnes, R.F.C.

Royal Aero Club Special Certificate.—The following Royal Aero Club Special Certificate was granted:—

7. Lieut.-Col. H. R. Cook, R.F.C.

Military Aeroplane Competition and Mr. S. F. Cody.

The following resolution was unanimously passed:—

Resolved that Mr. S. F. Cody be congratulated on his great success in the Military Aeroplane Competition, held on Salisbury Plain during the month of August, 1912, in which he obtained the first prize in the competition "Open to the World for Aeroplanes made in any country," and also the first prize in the competition "Open to British subjects for Aeroplanes manufactured wholly in the United Kingdom, except the engines." It was further resolved that the Royal Aero Club's gold medal be given to Mr. S. F. Cody in commemoration of these events, and in recognition of his successful pioneer work in aviation.

Arbitrations.—Prof. A. K. Huntington and Mr. E. C. Bucknall were appointed Arbitrators in two cases which have been submitted to the club for arbitration.

Flights over the Thames through London.

The Home Secretary has informed the Club that he proposes to call a conference at the Home Office, about the middle of October, to discuss the question of the control of aviation over London and up the Thames, and has invited the club to send representatives to the conference. The following representatives have been appointed: Prof. A. K. Huntington, Mr. F. K. McClean, Mr. A. Mortimer Singer, Sir Charles D. Rose, Bart., M.P.

Gordon Bennett Aviation Cup.

Mr. C. Grahame-White and Mr. G. Hamel have informed the Club that it will be impossible for them to represent the British Empire in the Gordon Bennett Aviation Race. This race takes place in Chicago on the 9th inst., and will now be confined to the representatives of America and France.

The late Mr. C. Lindsay Campbell.

The Royal Aero Club has forwarded to the Australian Commonwealth a cheque for £10 10s. towards the fund now being raised on behalf of the widow of the late Mr. C. Lindsay Campbell.

Fédération Aéronautique Internationale.

Mr. R. W. Wallace, K.C., has been appointed to the Arbitration Court of the Fédération Aéronautique Internationale to represent the Royal Aero Club.

British Empire Michelin Competitions.

Intending Competitors are again reminded of the following prizes:—

- | | |
|--------------------------------------|-------------|
| British Empire Michelin Cup No. 1... | £500 Prize. |
| British Empire Michelin Cup No. 2... | £600 Prize. |

The Competition for No. 1 Prize closes on October 31st, 1912, and No. 2 on October 15th, 1912.

The rules can be obtained on application to the Secretary.

Aviation Insurance.

The Committee has had under consideration the whole question of Insurance against Risks to which aviators are exposed. Several interviews with underwriters at Lloyd's have taken place, and the Club approved the terms and conditions of a policy to cover all or any of the under-mentioned risks: Accidental damage to machines; third party liability; fire; transit; personal accident. The policy is known as the Primus policy, "officially approved and recommended by the Royal Aero Club of the United Kingdom." Particulars may be obtained on application to Bray, Gibb and Co., Ltd., 166, Piccadilly, London, W., or Matthews, Wrightson and Co., Ltd., 39, Old Broad Street, London, E.C.

166, Piccadilly.

HAROLD E. PERRIN, Secretary.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Ground.

THE past week has been considerably more favourable to aviators than the preceding ones, and every opportunity was made the best use of. On Tuesday Commander Samson flew the 100-h.p. tractor waterplane S 41 from Harwich to Sheerness, arriving shortly after 1.30 p.m. In the evening the Breguet had an engine run preparatory to the 1 hour's flight test, but had only been going a few minutes when the propeller gear drive casing smashed up and put her out of action. The Chenu engine certainly is not showing to the best advantage in this country; possibly it is sheer bad luck, but I am afraid it will be some time before they recover from the effects. Amongst those flying during the evening were Lieut. Gregory on the Etrich monoplane, Capt. Gordon, Farman; Mr. Alec Ogilvie, N.E.C. engined Wright, with Mr. Fowler as passenger. On Wednesday morning Mr. Ogilvie took his N.E.C.-Wright machine out, but finding the air very bumpy he postponed flying until the evening, when Commander Samson, Short monoplane; Lieut. Gregory, Etrich; Lieut. Malone, 100-h.p. Triple Tractor; Capt. Gordon, Farman; Lieut. Briggs, School biplane, were also out. Mr. Guy Fowler passed the first half of *brevet* test on Mr. Ogilvie's N.E.C.-Wright, but was unable to complete on account of failing light.

Thursday proved to be a day in the sheds, but Friday evening more flying was possible, although the wind was very tricky below 400 ft. Commander Samson flew the old School biplane 38, now converted into late Farman style and weighing rather less than before. The machine climbed well, and after returning to *terra firma*, picked up two passengers and climbed to 1,000 ft. in four minutes some few seconds. Lieut. Parke, of "Nose Dive" fame, took No. 38 up for a height trip with passenger, climbing up to 3,000 ft.: the machine appeared to be stationary for several minutes on account of the stiff breeze up aloft, and gave one the impression that it was "helicopting." Mr. Guy Fowler completed the second half of *brevet* test on Mr. Ogilvie's N.E.C.-Wright, which he satisfactorily passed, flying at 650 ft. and landing 5 yds. from the mark. Capt. Gordon took several passengers on the Farman, including Mr. Ogilvie, with whom he encountered a 16-mile gust which somewhat shook the machine while over the back of the sheds. It was apparently due to a thunderstorm which was passing about six miles to the south-west of the aerodrome at the time. Lieut. Grey flew the Deperdussin for several circuits, this machine, together with the 100-h.p. Triple Tractor, 70-h.p. Tractor, T 5 and 50 Short monoplane being the machines which will be flown to Cambridge during this week for the Military Manœuvres.

Saturday again supplied a flying evening, and Commander Samson, with Lieut. Briggs as passenger, took out 38 converted for a height climb, reaching 4,850, when he had to descend on account of intense cold, it being then very nearly dark. In the morning Lieut. Parke flew with passenger to Chatham, returning after midday. Capt. Gordon flew Farman in usual approved style. Jezzi out with passengers on own biplane.

Sunday Jezzi had aerodrome to himself; and Monday early morning Seaman Russell was on school machine doing straights.

Brooklands Aerodrome.

MONDAY last week no flying due to bad weather; Tuesday evening many machines out working hard. Mr. Hotchkiss and Mr. Merriam first out on Bristols, taking up passengers for tuition flights in quick succession. Amongst their pupils carried were Lieuts. Sazil, Lafoet, Abdullah, Ali, Sahni, Said, and Loutcliffe, amongst the English passengers were Lieuts. MacLean, Hanlon, Pen Gaskell, Carmichael, Capt. Styles, MacDonnell, Price, Messrs. Payze and Hall. Lieut. Gould flew his *brevet* at about 500 feet taking an average time of 17 mins. for each half, making really perfect landings. Then Lieut. Playfair went away for his first half of *brevet* which he flew splendidly for, but light was failing, so decided to postpone second half till next day. Amongst other solo flyers on Bristols while *brevets* were being taken were Messrs. Pickles, Summerfield, Darracq; Capt. Miller, MacDonnell and Boger; Lieuts. Wanklyn, Hope, and Carmichael; and Mr. Cheesman. It is worthy of note that every English pupil who was flying as a passenger on Tuesday had before the week was out flown solus. On the Bristol monoplanes, Mr. England, Mr. Barnwell, Mr. Bettington and Prince Cantacuzene were all flying well.

The next morning Lieut. Playfair was away early, and secured the second half of his *brevet*, Lieut. Wanklyn following quickly flying both tests in quick succession, thus gaining another *brevet* for the Bristol School. Capt. Boger, who was flying very well for straight flights, got into another machine's back-wash when landing and cracked up his under-carriage. Wednesday evening, Mr. Hotchkiss was out on a new school side-by-side two-seater monoplane with dual control testing. This machine will be a great acquisition for school purposes for monoplane tuition. Friday a lot of work was put in by Mr. Merriam and Mr. Hotchkiss, making between them as many as over 50 flights. All the solus pupils were out as well on other machines. Two noticeable pupils at the Bristol School are Messrs. Summerfield and Cheesman.

Vickers School have had all their machines out nearly every day. Tuesday morning Mr. Knight was flying high on No. 5 for some time. Capt. Stott and Mr. Geere were both out on No. 4 flying straight lines.

Wednesday and Friday Vickers machines out doing a lot of work, Capt. Scott getting practice behind Mr. Knight on their Farman biplane. Mr. Knight out many times on that machine. Capt. Wood was seen out flying straights on Vickers No. 5. Saturday Mr. Knight was flying No. 5 excellently for a long time.

Avro school machine came out on Thursday evening in the hands of Mr. Simms, who put up several circuits of Brooklands in a wind that kept all the school and other machines doing no more than straights. Saturday, Mr. Simms was out amusing the many spectators that turned up in the evening.

On Wednesday morning about 10 a.m. the Army dirigible "Gamma" paid Brooklands a visit. She came over at an altitude of about 500 ft., and circled round the aerodrome, coming down to earth in front of the Blue Bird, staying some few minutes, then rising most majestically and sailing off back to Farnborough. She had on board Capt. Brabazon, who as recently as last week took his pilot's certificate at the Bristol School at Brooklands.

Saturday evening a good crowd visited Brooklands, and as many as eleven machines were seen flying continually. Mr. Hotchkiss was on a two-seater monoplane, Mr. Merriam on a single-seater, Mr. Spencer on his biplane, Mr. Knight on Vickers mono. and biplane, Mr. Raynham and Mr. Hedley on the Sopwith Farman, and Mr. Sims on the Avro. In a bomb-dropping competition, out of five entries Mr. Hotchkiss won the bomb-dropping with 9 ft. from target, and in a landing near the mark competition Mr. Knight on the Vickers Farman won with 5 ft. to Mr. Hotchkiss's 14 ft. After this competition a big lot of flying was done by pupils, and it was quite interesting watching their uncertain antics. On Sunday evening Mr. Sabelli arrived from Hendon



A GROUP OF BRISTOL PUPILS AT THE BROOKLANDS AERODROME.—Reading from left to right (sitting): Lieut. Joubert, Capt. Millis, Lieut. Gould, Capt. Styles, Capt. Brabazon. Centre row: Lieut. Playfair, Mr. Merriam and Hotchkiss. Top row: Lieut. Parker, Lieut. Pen Gaskell, Lieut. Hope, Major Ashmore, Messrs. Summerfield, Cheesman, Barnwell, Darracq, and Capt. MacDonnell.

reaching Brooklands at a height of about 2,000 to 3,000 ft., and came to earth with a beautiful steep spiral glide which showed the ability of this pilot; it was one of the finest descents seen at Brooklands for some time. Earlier in the day Mr. Sippe arrived on the 100-h.p. Hanriot from Salisbury, making a splendid flight, returning from the Army Trials, where he has done so well.

Mr. Harrison arrived, at about 4,000 ft., on Monday morning from Salisbury on a Bristol two-seater monoplane, carrying as a passenger a foreign officer, who is making observation of this machine. Mr. Harrison is certainly a man for this work, as he was flying the machine perfectly, which the officer could not speak too highly about. He made the journey in 50 mins., and spent the greater part of the journey dodging clouds at an altitude of about 4,000 ft.

Eastbourne Aerodrome.

MR. HAMMOND was up on Wednesday morning last week shortly after 5.30 a.m., giving instruction to Lieut. Duberly. Mr. Fowler had the Gnome-Blériot out for the first time since his smash, and made several circuits. Messrs. Foggin and Gassler were also on the 28th both doing well. Mr. Gassler made quite a long flight to Hampden Park and back. In the afternoon Mr. Hammond took Captain Bull for a short flight, and afterwards gave Lieut. Duberly and Mr. Lerwill some rolling instruction on the Bristol. Thursday was too rough for outdoor work. On Friday evening Lieut. Duberly and Mr. Lerwill received further instruction on the biplane. Lieut. Bone was doing straights on the 25-h.p. Anzani. Saturday turned out a beautiful day, and the pupils got in some useful practice. Lieut. Bone tried the 28-h.p. for the first time, and after one or two runs was able to do straights in good style. Mr. Lerwill was doing short hops on the Bristol, and Mr. Fowler was out on the Blériot again. Mr. Corbett Wilson, who made such a splendid flight from Calais arrived about 4.30 p.m. Unfortunately he ran out of petrol at Hurstmonceux, a few miles from the aerodrome. In landing, he slightly damaged the tail. Repairs were carried out on the spot by the aerodrome mechanics and Mr. Wilson's mechanic. Sunday afternoon saw Mr. Fowler out again on the Blériot; he intended visiting Mr. Wilson, but ran into a rain storm at Pevensey, and was obliged to turn back. Later Mr. Bone was doing straights on the 28-h.p. in excellent style. On Monday Mr. Fowler flew over to visit Mr. Wilson at Hurstmonceux. In the evening the wind dropped, and some practice was put in. On Tuesday Mr. Wilson flew over from Hurstmonceux, arriving at the aerodrome about 8 a.m. He made several excellent flights during the day. In the course of the morning Mr. Foggin had a slight smash on the 28-h.p. The wind freshened in the afternoon, but in the evening Mr. Fowler was out, followed very shortly by Mr. Wilson, who was testing his machine, preparatory to his proposed flight to Salisbury on Wednesday.

Farnborough (R.F.C.)

TUESDAY evening last week Capt. Reynolds and Major Moss each made flights on M. Farman, Capt. Rayleigh on 100-h.p. Breguet, Lieut. Carfrae on Breguet B 3, Lieut. Barrington-Kennett on BE 3, Lieut. Longcroft on BE 1, Capt. Darbyshire, Capt. Webb-Bowen and Lieut. Mackworth each on BE 5, Capt. Gerrard, R.M.L.I., out on Nieuport, Mr. de Havilland on Deperdussin. All flying till dark. During the evening Mr. de Havilland returned from Salisbury on BE 2, with Major Brooke-Popham as passenger. Lieut.-Col. Cook, flying for superior *brevet*, had to come down at Mortimer owing to broken petrol pipe. Raynham out on New

Flanders monoplane. On Wednesday early airship "Gamma" made several trips. Major Moss on M. Farman, Capt. Reynolds 20 min. flight at 2,000 ft. with passenger on M. Farman, Capt. Hamilton on Dep., Lieut. Longcroft on BE 1, Capt. Darbyshire, Capt. Webb-Bowen and Lieut. Mackworth each on BE 5, Lieut. Barrington-Kennett and Major Brooke-Popham each on BE 3, Capt. Rayleigh and Lieut. Carfrae both out on 100-h.p. Breguet, Major Burke on BE 1, Capt. Webb-Bowen also on Breguet B 3. In the evening Capt. Rayleigh on 100-h.p. Breguet with Lieut. Longcroft as passenger did a flight of 1 hr. 35 mins. duration at 5,000 ft., Lieut. Carfrae on Breguet did a short flight with two mechanics as passengers.

Thursday morning Capt. Hamilton did two flights on Dep., then left for Salisbury, followed by Major Brooke-Popham on BE 3. In the evening Major Burke and Lieut. Longcroft each made flights on BE 1. Early on Friday morning Porte, on New British Deperdussin, was out doing War Office tests, Capt. Rayleigh on 100-h.p. Breguet several long flights. Major Burke left for Thetford, but had to descend at Hatfield owing to a broken oil pipe. In the evening Capt. Rayleigh was out several times on 100-h.p. Breguet, and Mr. de Havilland was taking passengers, including an Australian officer, on BE 2. At 9.30 p.m. airship "Gamma" started, and made two half-hour trips, going well in gusty wind. On Saturday morning Capt. Rayleigh was on 100-h.p. Breguet, Lieut. Carfrae did a 70 mins. trip with passenger on 100-h.p. Breguet, Capt. Darbyshire and Capt. Webb-Bowen each were trying BE 5, and "Gamma" made several long trials. In evening Captain Webb-Bowen on BE 5 and Capt. Rayleigh and Lieut. Carfrae on 100-h.p. Breguet flying till dark. Airship "Gamma" again made several cruises after dark. On Sunday evening Lieut. Longmore left for Upavon on new Deperdussin, Cody on his 'bus, and Lieut. Fox with passenger on BE 3 arrived from Salisbury, the latter coming down by a fine spiral *vol plané* from 2,000 ft. On Monday early "Gamma" several trips; Capt. Rayleigh and Lieut. Carfrae both on 100-h.p. Breguet with passengers. The latter was out in the evening, when Capt. Darbyshire on BE 5 and Mr. de Havilland on BE 2 and Cody made several circuits.

Early on Tuesday "Gamma" was out for scouting practice. Capt. Darbyshire, Capt. Rayleigh, Lieut. Carfrae and Lieut. Fox all put in good work, while Mr. de Havilland flew to Windsor and back on BE 2 with passenger. Capt. Beor arrived from Salisbury on BE 4, Major Burke while flying BE 5 had slight accident and broke wing tip. Lieut. Wadham and Lieut. Ashton, each flying Deperdussins, arrived from Salisbury about 9.30 a.m. "Gamma" came out and started for Whale Island, but when about half way broke crank shaft, so returned to depot after about 75 mins. in the air. 11 a.m. Mr. de Havilland, with Lieut. Fox as passenger, left on BE 2 for manoeuvre area round Windsor. Capt. Rayleigh several flights on Breguet during the morning. Lieut. Wadham left for Salisbury on Deperdussin. Raynham on Flanders monoplane was doing War Office tests.

Liverpool Aviation School, Waterloo.

THE tempestuous weather of the past week prevented pupils getting any further practice.

Tuesday. Melly, in two-seater, flew 3 miles northwards by himself, having attained a height of 1,000 ft., circled Ince Woods and then returned to the hangars.

Thursday. Notwithstanding a very strong wind Melly again had out the two-seater, and flew to Audlem, in Cheshire, where a flower show was being held on that day. It was a hard tussle with the wind all the way, and the wind continuing equally bad all the afternoon and evening, no exhibition flights were attempted. The return journey, which should have taken place at 6 o'clock in the evening, was postponed till the following morning. An early start was made in a light breeze with Mr. Birch as passenger, and after circling once round, Melly headed off for Beeston Castle, but failing to get the machine to climb more than 150 ft. he decided to land his passenger a couple of miles from Nantwich, the engine missing badly. However, a fresh start was made, and Melly headed off in a direct line across the Wirral to Ellesmere Port, where he joined the south side of the Mersey. By then the wind had increased to about 35 miles an hour, and progress was exceedingly slow, and as it was undesirable to fly 10 miles down the Mersey with a missing engine, he circled to the south of Birkenhead and Bidston, passing over New Brighton, where the wind had attained such a velocity that only by planing down was sufficient progress made to reach the Waterloo Beach on the north side of the Mersey. The distance actually covered was 42½ miles in 1 hr. 37 mins.

London Aerodrome, Collindale Avenue, Hendon.

Grubame-White School.—Tuesday last week, School turned out at 7 p.m. under the superintendence of Mr. Lewis Turner, Lieuts. Allen and Stopford doing good straight flights on Sommer Biplane. Messrs. Hoelscher and Fuller straight flights on No. 7 Biplane, and Mr. Kinhardt and Lieut. Small rolling on same machine. Mr. Roupell doing straights on 35-h.p. Blériot.



Mr. Edouard Baumann, who has just qualified for his *brevet* at the W. H. Ewen School at Hendon, he passing the tests brilliantly on a 35-h.p. Caudron biplane.

School out at 8.50 a.m. Wednesday, again under the instruction of Mr. Turner. Mr. Fuller and Lieut. Stopford doing straight flights on No. 7. Lieut. Small and Messrs. Marrick and Kinhardt rolling on same machine. Mr. Roupell doing good straight flights on 35-h.p. Blériot.

Work started at 5.15 a.m. Saturday, under Mr. Turner. Lieut. Allen and Captain Halahan doing straight flights on No. 7. Messrs. Fuller and Hoelscher straight flights and Lieut. Small and Mr. Marrick rolling. Captain Halahan, in trying to rise too quickly, pancaked, and smashed chassis struts. Mr. Roupell doing good straight flights and excellent landings on 35-h.p. Blériot.

Blériot School.—Monday last week, no schoolwork owing to wind and rain.

Tuesday evening Messrs. Hall, Sacchi and Reilly were practising; Mr. Hall circuits preparatory to going for his ticket in morning; whilst Mr. Sacchi was also doing similarly on LB 3. Mr. Reilly got in 2 rolls on LB 1. Mr. H. J. D. Astley was in the afternoon trying Miss Trehawke Davies' 70-h.p. tandem two-seater prior to a cross-Channel trip on the following morning.

Wednesday—Miss Davies and Mr. Astley were early at the Aerodrome waiting for the morning mist to rise to enable them to start off to Paris on the former's two-seater. As soon as No. 1 pylone was visible at 100 yards they made a fine start, the machine quickly being lost to sight in the mist, and only the sound of the engine remaining to tell the whereabouts of the machine.

Later Mr. Hall went up on LB 4 to do the tests for his certificate and did the first half in good style, this including preliminarily a little jaunt over the surrounding countryside. The rising wind, combined with an overheating engine due to a partially choked oil feed pipe, led to his waiting for a later opportunity to do the second half of his test.

Thursday and Friday were blank owing to bad weather. Saturday was ideal, and a lot of practice was indulged in by pupils, Mr. Sacchi did 2 straights on No. 3 and Mr. Welbrun was similarly employed; whilst Mr. Reilly confined himself to rolling practice on the "taxi."

Mr. L. S. Metford took out No. 4 to test new elevator, and taking machine up to about 300 feet found about 25 m.p.h. wind blowing, and decided to come down again, finding himself too busy with only a 30-h.p. motor in front.

British Deperdussin School.—Wednesday morning last week, Mr. Brock one figure of eight on *brevet*, then took his *brevet* on *brevet* machine. Cadet Robinson straight on *brevet*. Lieuts. Tucker and Hawker, Messrs. Andrews, Spratt, Phelps, and Durand all out on taxi No. 2. No flying Thursday, too windy. Friday morning, Lieuts. Tucker and Hawker, Capt. Macdonell, and Messrs. Andrews, Spratt, and Phelps all out on taxi No. 2. Then Mr. Spratt got on to bad ground, and broke front skid and strut on off-side, also propeller. Gill, two circuits on racer.

Lieuts. Tucker and Hawker, Saturday morning doing straight flights on taxi No. 2. Cadet Robinson excellent straight flights on *brevet* machine up to 50 ft. with good *vol plané* landings. Capt. Macdonell and Messrs. Andrews, Spratt, Durand, and Phelps all rolling on taxi (progress good). Mr. Whitehouse (new pupil), rolling on taxi No. 1, and making good progress.

Monday, Lieut. Hawker, Messrs. Andrews and Spratt all doing straight flights on taxi No. 2. Gill two circuits on racer.

W. H. Ewen School.—Although last week opened doubtfully as regards weather, the elements considerably improved on Tuesday, and a considerable amount of work was got in on every day following. On Tuesday evening, under the instruction of M. Dubois, Messrs. Conran, Lawford and the James Brothers, and Lieuts. Bayly and McMullen did some good straights and flying on No. 1 monoplane. After two test flights on 35-h.p. Caudron biplane by Mr. Ewen, Messrs. Sutton and J. H. James made their first solo flights on the same machine. Mr. Ewen then took Messrs. Sutton and the James Brothers for further air instruction. On Wednesday the wind dropped at 7.30 a.m., and the pupils were seen taking advantage of the spell. Messrs. H. James, Conran, and Lieuts. Bayly and McMullen had some good practice. After breakfast the pupils were again out, and, in addition to the above, Messrs. Gist and Warren were making several nice flights on No. 2 monoplane. Following an exhibition on the 35-h.p. Caudron biplane by Mr. Ewen, Messrs. Sutton and J. H. James did good solo work on the same machine. Mr. Ewen then took some of the pupils up for passenger flights. Thursday was rather unfavourable for solo work for the pupils, but in the evening Mr. Ewen brought out the 35-h.p. two-seater Caudron, and took several of the pupils up for air instruction. Mr. Richard T. Gates also made his first flight in a Caudron aeroplane. The pupils were out at 5 a.m. on Friday, and all were making splendid progress, with Lieuts. Bayly and McMullen and Mr. H. James on monoplane No. 1, and Messrs. Baumann and J. H. James on 35-h.p. Caudron. Mr. Ewen was making short flights on 35-h.p. Caudron, after which, the wind having put a stop to school solo work, he took the above pupils up for further air

experience. On Saturday the school was out at 4.30 a.m., when M. Dubois had Lieuts. Bayly and McMullen and Messrs. Conran and H. James doing progressive work on No. 1 monoplane. A big morning's work was put in, and all the above pupils advanced confidently into the flying stage. The event of the morning, however, was M. Baumann completing his tests for his *brevet*, which he did on the 35-h.p. two-seater Caudron biplane. He flew all the time at an altitude of 200 ft., and banked and handled the machine in quite expert style. His smartness proves his aptitude as a flyer, and at the same time shows with what ease the Caudron biplane can be handled.

M. Dubois, who has been a favourite instructor at the school, left for France, to take up his military service in the Flying Corps.

Salisbury Plain.

Royal Flying Corps.—Tuesday evening last week saw the finish of the Military Competition, and de Havilland on BE 2 with Major Brooke-Popham as passenger made for Farnborough, Capt. Hamilton on the Deperdussin monoplane with Lieut. Ashton as passenger also departing.

On Wednesday morning Capt. Hamilton and Lieut. Ashton, having got back to Salisbury again, were out scouting around the camps. Capt. Hamilton then left by motor for Farnborough to fly back another Deperdussin monoplane. He arrived back at Salisbury Plain in a very stiff wind at about 11.30, also Major Brooke-Popham on BE 3. In the evening the latter officer was doing some very useful flying in a gusty wind. The Dunne monoplane took off, and rising to a height of 100 ft. went over to Knighton Down, where a bad landing was made on the rough ground. Owing to the unsettled weather no outdoor work was done Thursday until the evening, when Lieut. Fox was out on BE 3 biplane. He afterwards took a passenger to a height of 1,400 ft., Major Brooke-Popham also took the same machine to a height of over 2,000 ft., and Capt. Hamilton tested the Deperdussin (Captain Fulton's) which had been overhauled at the Farnborough factory in a 25 mile wind.

Early on Friday morning was ideal for flying, and Major Brooke-Popham was first out on BE 3, and after taking up a passenger went for an hour's scouting practice. Lieuts. Porter and Wadham made their first solo trips in monoplanes.



"Flight" Copyright.

Mr. Sabelli, who has been doing such splendid flying at Hendon and round the country recently.

Lieut. Chartres did well on the Deperdussin, and Lieut. Ashton took up Lieut. Moore as passenger on the Deperdussin monoplane. Lieut. Bettington was flying well on the 256 Bristol monoplane at a good height, also Capt. Allen. Mr. Pixton then took up Capt. Allen as passenger on a new Bristol monoplane for speed test and rolling before handing machine over to the R.F.C. Major Carden made two tests on the Dunne biplane and Mr. Cody took up Capt. Hamilton to a height of 1,000 ft. in 2 mins. 50 secs. On landing he ran over a ditch, but the only damage done was a couple of wires broken. The evening saw plenty of good flying, Lieut. Fox, on No. 203 factory-built biplane made half-a-dozen flights at heights up to 1,200 ft., banking very sharply.

Lieuts. Chartres, Ashton, Porter and Wadham were out on 257 Deperdussin. Lieut. Bettington and Capt. Allen on 256 Bristol monoplane. Mr. Dunne's monoplane was being tested. On Saturday morning early the Bristol and Deperdussin monoplanes were kept busy, and Capt. Hamilton made three trials on one of the R.F.C.'s new 70-h.p. British Deperdussin monoplanes, taking it up to 1,800 ft. Lieut. Longmore on Maurice Farman biplane No. 403 paid a visit from the Central School at Upavon, arriving at a height of 2,000 ft. In the evening Major Brooke-Popham was out on 204 and 205 factory-built biplanes, and Lieut. Fox returned from Tisbury flying at a height of 1,400 ft. Lieut. Porter came in from Tisbury on the Deperdussin.



BRITISH NOTES

ROYAL FLYING CORPS.

The following appointment was notified in the *London Gazette* of September 3rd:—

Special Reserve of Officers. Royal Flying Corps. Military Wing.—William Ewart Gibson to be Second Lieut. (on probation). Dated September 4th, 1912.

War Office and Private Aeroplanes.

In this month's Army Orders is included a notification that the following allowances will be paid to officers of the Royal Flying Corps for hire of aeroplanes approved for use in lieu of War Department aeroplanes:—For an aeroplane belonging to and used by an officer on probation for the Royal Flying Corps during his preliminary training in that corps; or by an officer of the First Reserve of the Royal Flying Corps at manoeuvres or other military exercises for which he has been detailed: (a) In its first year (reckoned from date of purchase from the manufacturer), 1 per cent. on purchase price, per week. (b) In its second year, two-thirds per cent. on purchase price, per week. (c) In any subsequent year, if machine still passed as suitable, $\frac{1}{2}$ per cent. on purchase price, per week. Fuel, lubricants, and repairs to be provided free by the War Department. For an aeroplane belonging to an officer of the First Reserve of the Royal Flying Corps, and used by him for quarterly flying tests at a military station: (a) In its first year, 1 per cent. on purchase price, per hour of test. (b) In its second, '06 per cent. on purchase price, per hour of test. (c) In any subsequent year, if machine still passed as suitable, '05 per cent. on purchase price, per hour of test. Fuel, lubricants, and repairs to be provided free by the War Department. For an aeroplane belonging to an officer of the First Reserve of the Royal Flying Corps, or hired from a private company, used to carry out quarterly tests at a private aerodrome: 4 per cent. of the purchase price of the aeroplane for each completed quarterly test of nine hours in the air, including cross-country flights, this rate to cover all risks and the supply of fuel and lubricants. In submitting claims for allowances, officers will attach a certificate, signed by themselves in the case of their own aeroplanes or by the owners in the case of hired aeroplanes, as to the purchase price of the aeroplanes used, and, where necessary, the date of purchase.

Major Bannerman Retires.

MAJOR SIR ALEXANDER BANNERMAN, who will be remembered as the Commander of the erstwhile Army Air Battalion, which is now merged in the Royal Flying Corps, retired from active service on Wednesday of last week.

The Scottish Aviation Base.

SITUATED immediately to the east of Forth Bridge, about two miles from Rosyth and four from Crombie, is a ground which has been secured by the Government for the establishment of a hydro-aeroplane base for the East Coast of Scotland. Evidently no time is to be lost in establishing the centre, as the tenants have been warned that the ground will be required within six months. The long flat yellow sand at this point should make an almost ideal aerodrome for hydro-aeroplanes and it forms a good base from which to make surveys over the upper reaches of the Forth and over the whole of the Estuary to the North Sea.

Capt. Hamilton was up very high on the British Deperdussin monoplane, and Lieut. Ashton went over to the Central School at Upavon. Major Carden made a flight on the Dunne biplane, and the Dunne monoplane also made a good trip.

Lieut. Bettington started the ball rolling on Sunday morning with the 256 Bristol monoplane, and was up 2,000 ft. for three-quarters of an hour. He was followed by Captain Hamilton, Lieut. Porter and Lieut. Stewart. The Vickers monoplane was out with Macdonald in charge, and made a good flight around the Plains. Raynham was out on the Martin-Handasyde, and Lieut. Porte took Captain Dawes as passenger on the British Deperdussin. They took off at 4.44 for Hendon, and completed the journey in five minutes over the hour.

Mr. Cody on his biplane took off at 6.3, with his son Leon as passenger, and after flying around Salisbury, left for Farnborough, followed at 6.14 by Lieut. Fox, with Lieut. Chartres as passenger, on 203 factory-built biplane. On Monday Lieut. Bettington put up $\frac{1}{2}$ -hour flight on a Bristol monoplane, and in the evening Capt. Hamilton on 100-h.p. Deperdussin was flying at a height of 500 ft. Gordon Bell, Lieut. Ashton, Capt. Allen and Lieut. Bettington were also out. On Thursday Capt. Hamilton on the 100-h.p. Deperdussin monoplane, did a cross-country flight to Wallingford, Lieut. Ashton on a Deperdussin left for Farnborough, and also Lieut. Wadham.



OF THE WEEK.

Hydro-aeroplanes over Lake Windermere.

AN enquiry was held at Windermere on the 27th ult. by Sir W. P. Byrne, Assistant Under-Secretary to the Home Office, regarding the application of the Windermere Council to the Board of Trade asking for a rule limiting vessels to a speed of 12 m.p.h. over certain portions of the lake. In giving evidence, the Clerk to the Council said they were acting solely in the interests of public safety and with no animosity to flying machines. Opposition was forthcoming from the Furness Railway Co., who contended that such a limit would add ten minutes to the time taken by their steamers from Ambleside to Lakeside and so interfere with their connections. Mr. E. W. Wakefield gave evidence in opposition, and said there were three hydro-aeroplanes on the lake, and the Lakes Flying Co. had successfully converted a monoplane and had orders from the Admiralty for another. He would meet the authorities with a view to limiting the number of machines on the lake, and he would not be opposed to restrictions confining pupils to certain parts. Lake Windermere was 25 per cent. safer than any other aerodrome in the country, and was the most suitable sheet of water in Great Britain for learners. Sir W. Byrne said he would report to the Home Secretary and the Board of Trade, and any proposed regulations would be submitted to the Windermere Council for their observations.

82 Miles in 65 Minutes.

AT the conclusion of the Military Trials at Salisbury, Lieut. Porte on the 100-h.p. Anzani motor British-built Deperdussin, with Capt. Dawes as passenger left Salisbury Plain for Hendon. He covered the 82 miles in an hour and five minutes and during the trip was at a height of 3,000 ft.

Mr. Slack's Southern Tour.

CONTINUING his tour in the South of England in the interest of the International Correspondence Schools, Mr. Robert Slack landed on Smitham Down in the afternoon of the 30th ult. Later he left for Brighton and reached the Shoreham Aerodrome having taken 32 minutes for the 40 miles and keeping mostly at a height of 4,000 feet.

Flying at Hendon To-day.

THE programme for this (Saturday) afternoon at Hendon includes a cross-country handicap of about sixteen miles, and a speed handicap which will be run off in heats over four laps of the Aerodrome course, while the final will be over six laps. There will also be the usual exhibition and passenger flights. Flying is timed to start at 3.30 p.m. and will continue till dusk.

Flying to the Flower Show

ON Thursday of last week Mr. H. G. Melly flew from his Aerodrome at Waterloo, near Liverpool, to the Audlem Flower Show. Although he had to contend with a headwind he made the journey in an hour and twenty minutes at a height of 2,500 ft.

Wedding Bells.

ON Saturday last, at Anselm's Church, Davies Street, W., Mr. E. J. Robinson, the well-known managing director of New Pegamoid Ltd., was married to Miss Mabel Alice Bishop, of Beach Towers, Bexhill. The reception was held at 48, Queen Anne Street, the residence of the bride's sister, Mrs. Harry Spon.

Royal Aero Club Year-Book.

ALTHOUGH in the main the Royal Aero Club Year-book for 1912 follows on the same lines as its predecessors, one or two improvements have been made, and naturally the growth of the sport and industry is reflected by the increased bulk of the book. One new feature which should prove very useful is the inclusion of nine aviation maps, showing the country over a radius of fourteen miles round the flying grounds at Salisbury Plain, Brooklands, Eastchurch, Eastbourne, Farnborough, Hendon, Oxford, Shoreham, and Whitfield (Dover). These maps are of the well-known Clift-Gross type, and prepared by Geographia, Ltd., and the magnetic courses, as well as the distance, to each of the other flying grounds is given on each. The Year-book is a regular *vade mecum* on official aviation matters, and besides giving the rules and regulations governing competitions open to Britishers, including tests for certificate as either aeroplane, dirigible or balloon, gives holders and past holders of the principal prizes, records, &c.

Typewriting on an Aeroplane.

INCIDENTAL to the demonstration of the advantage of the Avro enclosed body, was an interesting and unique flight from Salisbury Plain to Upavon during which H. V. Roe, who was the passenger with Lieut. Parke, took a Monarch typewriter with him and typed very clearly particulars of the machine and a note on his impressions during the journey in mid-air.

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THE DAILY MAIL DEMONSTRATION.

ON Wednesday of last week Mr. C. Grahame-White, accompanied by his wife, went on from Southend to Clacton, taking about half an hour for the trip, and Mr. Noel afterwards took the machine to Walton-on-the-Naze and back in twenty minutes, doing one or two "stunts" at Frinton, as he went by. Mr. Grahame-White afterwards took up several passengers, and later set off for Southend with his wife. Early in the day both Mr. Noel and Mr. Travers had made passenger trips at Southend. At Burton-on-Trent, M. Salmel, after ten minutes at a height of 600 ft., flew over to Chester, covering the 60 miles in 48 minutes. It transpired that Mr. Grahame-White was not successful in getting back to Southend, being brought down near Burnham by motor trouble. To add to the difficulty, a back-fire set the carburettor on fire, and by the time this was put out the machine was drifting five miles from land. Some yachtsmen picked up Mr. and Mrs. Grahame-White, and by the aid of his motor boat Mr. White later towed his machine into the harbour. On the arrival of the mechanics, repairs were at once put in hand. Thursday saw Mr. Hamel making his way, at 100 m.p.h. with the wind behind, from Buxton to Sheffield; M. Salmel went on to Preston, calling at New Brighton on the way, and Mr. Hucks made two flights at Aberdeen. At New Brighton a lady passenger, Miss Murry, had an exciting experience on M. Fischer's hydro-aeroplane. When preparing for a flight the machine broke away before the pilot had taken his seat, and after drifting along the Mersey it eventually turned turtle. Several swimmers went to the assistance of Miss Murry, who was rescued little the worse for her experience. The weather prevented much flying on Friday, but Mr. Travers took Mr. Grahame-White's machine from Burnham to Southend. On Saturday Mr. Grahame-White, Mr. Travers, and Mr. Noel made flights at Southend and the neighbourhood, and in the evening Mr. Travers started for Hendon. He landed at Shoburness and changed the floats for wheels, but found it too dark to go on. M. Salmel crossed Morecambe Bay, going from Preston to Ulverston and Barrow-in-Furness, and in Scotland Mr. Hucks made five flights at Aberdeen, two in the evening with his machine illuminated.

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MRS. LINDSAY CAMPBELL FUND.

IN continuation of the lists published in our issues of August 24th and 31st, the following subscriptions are gratefully acknowledged by Mrs. Campbell:—

	£	s.	d.		£	s.	d.
Harry Turrill ..	0	10	6	Mrs. Grace ..	5	0	0
"W. O. W." ..	5	0	0	F. H. Dangar ..	5	0	0
Mrs. Bundock ..	1	1	0	Hon. Sir C. Mackellar	2	2	0
Miss A. K. Snow-				Charles Villiers Chap-			
Clifton ..	0	2	6	man ..	1	1	0
"W. A." ..	0	10	0	"T. M." ..	0	10	0
"N. S. P." ..	0	10	0	A. B. Piddington ..	1	1	0
Bridget O'Garth (2nd				Mesdemoiselles Simon	0	10	0
Donation) ..	0	5	0	Colonel F. C. Trollope	1	0	0
C. G. Tindal ..	2	2	0	Miss Snow-Clifton (2nd			
May Beatty Lauri ..	1	1	0	Donation) ..	0	5	0

Further donations will be acknowledged also in the *Daily Mirror* from time to time by Col. H. S. Massy, Vice-Chairman, Aerial League, 6, Coventry Street, W.

Hon. Alan Boyle in Harness Again.

FOLLOWERS of aviation will be interested to learn that the Hon. Alan Boyle, the youngest son of the Earl of Glasgow, has joined Messrs. J. D. Macdonald and Co., Ltd., Queensferry Street, Edinburgh, the Scottish agents for Vauxhall and Palladium cars. It will be remembered that Mr. Boyle, who was a flight pioneer, his R.Ae.C. certificate being numbered 13, met with a serious accident at Bournemouth in July, 1910, and since then has more or less spent his time abroad.

These Helped Mr. Cody to Win.

IT should not be overlooked that the biplane on which Mr. S. F. Cody won £5,000 in prizes in the War Office Trials, was fitted with a 120-h.p. Austro-Daimler engine, made by the same firm as produce the Austro-Daimler cars. During the whole of the trials Vacuum Mabiloil was used by Mr. Cody, while he also used Shell spirit, and was able to obtain maximum revolutions from the engine. All the prizes were won on Shell spirit, in fact no other fuel was used by any of the competitors. The propeller on the Cody machine was the Chauvière Integral, made by the Integral Propeller Co., Ltd. (L. Chauvière, 307, Euston Road, N.W.). A French-built Integral was used on the Deperdussin second prize winner, a British Integral was fitted to the British Deperdussin, and similar propellers were fitted to the Hanriot, M. Farman, and Blériot machines.

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THE MILITARY TRIAL AWARDS.—Mr. S. F. Cody's £5,000 smile.

HENDON SECOND AUGUST MEETING.

FAVOURABLE weather on Saturday last, enabled all three items on the programme for the second August meeting at Hendon to be carried out with great success. There was a good attendance also, about fifteen thousand all told; in fact it was quite like old times. A number of machines made their appearance too, although most of the favourite pilots were still away exhibition flying, &c. Mr. W. Moorhouse paid a short visit to the Aerodrome and we think we saw M. Pierre Verrier there as well—of course without their machines. The three events on the programme consisted of a cross-country handicap, a grand speed handicap, and an altitude contest. Each of these provided no small amount of excitement, the first two especially, thanks to the splendid handicapping of Messrs. Delacombe and Reynolds. Numerous trial flights were made before the first event, the cross-country race, started. The course for this item was to Elstree and back twice, a distance of about 18 miles.

Quite a good number of machines lined up for this event, viz.:—Lewis Turner (50-h.p. Gnome-rebuilt-Howard-Wright biplane), Louis Noel (80-h.p. Henry Farman), Marcel Desoutter (50-h.p. Gnome Blériot monoplane), James Valentine (50-h.p. Gnome Deperdussin), and G. Sabelli (50-h.p. Gnome Hanriot). W. H. Ewen was to have flown the Caudron biplane, but did not start. The limit man was Sabelli, giving the others the following handicaps:—Turner 13 mins., Noel 4 mins. 30 secs., Desoutter 3 mins. 15 secs., and Valentine 1 min. 15 secs. Desoutter turned back before he had left the Aerodrome, as his engine was missing rather badly. The others all completed the first circuit in the same order in which they started, but Valentine did not continue on the second trip, as he missed the course at Elstree. Turner was the first back, to be followed close behind by Noel and Sabelli respectively. Turner's time for the course was 30 mins. 16 secs. Noel's, 32 mins. 37 secs., and Sabelli's, 33 mins. 45 secs.

After a short interval the first heat of the grand speed handicap over four laps of the aerodrome was held, there being four starters:—J. Nardini on the 50-h.p. Gnome Deperdussin (scratch), Lieut. Spencer Grey on a 50-h.p. Gnome Blackburn monoplane (1 min. 25 secs.), Lewis Turner on the Howard-Wright biplane (2 mins.

40 secs.), and A. Blackburn on a 50-h.p. Gnome Graham-White biplane. The last named came down after the second lap. On his first lap Nardini overtook Turner just before the end of the latter's second lap, and passed Grey in the next lap, but it was not until he was close upon the finish that he passed Turner and crossed the line first, 4 secs. ahead of the latter (time, 9 mins. 10½ secs.), Grey on the Blackburn came in a good third.

Four more started in the second heat as follows:—Sabelli on the Hanriot (scratch), J. Valentine on the 45-h.p. Anzani Deperdussin, Desoutter on the Blériot (21 secs.), and L. Noel on the 80-h.p. Gnome-Henry Farman. Noel managed to keep ahead and come in first (time, 7 mins. 4 secs.), whilst Desoutter and Sabelli had a stiff fight for second place 6 secs. behind, the former doing the trick by a bare ½ sec., Valentine coming in third about 1 min. behind. In the final, which was held shortly after, Nardini was at scratch, giving starts of 4 mins. 10 secs. to Turner, 1 min. 37 secs. to Noel, and 57 secs. to Desoutter. This time Turner came in first (time, 12 mins. 45 secs.), Nardini and Desoutter making a dead heat for the second place, Noel following 9 secs. behind.

By this time it was getting late, and shortly after 7 o'clock Desoutter and R. T. Gates, the latter on the Henry Farman biplane, went up for the altitude prize. Both machines climbed very rapidly and were soon lost in the gathering darkness. In order to enable the pilots to find the Aerodrome, petrol fires and red flares were lit. Gates was the first down, having reached 2,900 feet and Desoutter suddenly appeared from apparently nowhere shortly after, having beaten Gates by 150 feet. Whilst the altitude contest was in progress Lewis Turner was passenger carrying on the Howard-Wright.

Plenty of exhibition was seen on the following Sunday, proceedings being opened at 3.30 p.m. by Lewis Turner, followed 10 mins. after by Marcel Desoutter. Later, Jules Nardini came out on the Deperdussin, and numerous exhibition flights were given by these three aviators for the rest of the afternoon, Turner doing quite a lot of passenger carrying. Just before 6 o'clock Lieut. Porte, R.N., and Captain G. W. Dawes, R.F.C., as passenger, arrived from Salisbury Plain on the 100-h.p. Anzani Deperdussin.

FOREIGN AVIATION NEWS.

The Pommery Cup Competition.

QUITE the best flight so far registered in the Pommery Competition, which calls for the longest flight in a straight line in a single day, was that of Bathiat on Saturday last, when, starting from Calais at 5h. 38m. 4½s. a.m., he steered a southward course with the intention of getting to Biarritz in one day. He was mounted on a Sommer monoplane fitted with a Gnome engine and Chauviere propeller. His first stop was at Amiens, but it was only of sufficient duration to replenish the tank, and at half-past eight he reached St. Cyr and made another stop of a few minutes for the same purpose. A stop for lunch was made at Château Renault near Tours, and then he started for Poitiers, where he arrived at half-past two. Some time was spent in looking over his machine and filling up tanks, &c., but he got away again at five minutes past three. There was then a long run of two hours and a half to Bordeaux, where a landing was effected at the Croix d'Hins Aerodrome. He was in the air again at five minutes past six heading for Biarritz, but was brought down at Contis le Bains, about 83 kiloms. short of his destination. He had, however, succeeded in covering in a day 820 kiloms., which is a substantial advance upon best previous record, that of the ill-fated Bedel, who in April last went from Villacoublay to Biarritz, a distance of a little over 656 kiloms. The distance covered is practically the same as that from London to John o' Groat's "as the crow flies," or from Paris to Edinburgh. On the previous day, Brindejonc des Moulinais left Villacoublay on his Morane monoplane with the intention of going to Berlin and, if possible, reaching the Russian frontier. After covering 230 kiloms. in 1 hr. 27 mins. he stopped at Villers-sur-Mers, and restarting at half-past eight, was reported three-quarters of an hour later over Verviers, but on landing at Rude near Clervaux in Luxembourg, he decided to abandon his attempt. The same day, Guillaux, on his Clement-Bayard monoplane left Biarritz in the direction of Bordeaux and covered 195 kiloms. in 1 hr. 13 mins., but on coming down at Coutras, 16 kiloms. from Libourne, announced that he would not go on.

An English Attempt for Pommery Cup.

ACCOMPANIED by Miss Trehawke Davies on a Blériot monoplane Mr. Astley left Issy at 5.29 on Tuesday morning in an attempt to fly to Berlin for the Pommery Cup. They made a landing at Mezieres at 11.20, from whence they were away again at a quarter to two, and were next reported at Bonn, about half way to Berlin, at 7 p.m.

French Military Aviation.

THE new scheme for the organisation of French military aviation has now been published, and comes into effect on October 1st next. It provides for the provision of the aeronautic corps into three groups. Of the first group, the central portion, consisting of two aerostation companies and one aviation company, will be stationed at Versailles, with sub-sections at Chalais Merdon, Douai and Etampes, and with dépôts and workshops on the military grounds at Paris; and of the 1st, 2nd, 3rd, 4th, 5th, 9th, 10th and 11th army corps; and in Morocco and Tunis. The second group, also consisting of two aerostation companies and one aviation company, will have its central quarters at Rheims, with five sub-sections at Chalons, Verdun, Toul, Epinal and Belfort, while there will be dépôts and workshops on the grounds of the 6th, 7th and 20th army corps. The third group, consisting of one aviation company, will be centred at Lyon, with sub-sections at Avor and Pau, and dépôts and workshops on the grounds of the 8th, 12th, 13th, 14th, 15th, 16th, 17th, 18th and 19th army corps, and at Amberg.

Artillery Experiments in France.

THE use of aeroplanes as "eyes" for artillery was demonstrated at Toul last week and drew together a very large number of French Military Officers. Batteries at five different points were ordered to be in a state of defence at 5 a.m. and about 7 a.m. an aeroplane scouted over the country and reported that the targets representing the enemy were about five miles away on a slope between the Avrainville Woods and the Jaillon Plain according to the directions furnished by the observers, each battery opened fire and another aeroplane was sent up to observe results and within a short time it was reported that the targets had been demolished.

A Thousand Aviators in France.

ON the last day of August the Aero Club of France issued its one thousandth pilot certificate, the fortunate holder being an Italian, Carmanati de Brembilla. It is estimated that at the present time there are more than 2,000 aviators who have qualified for certificates in various countries under F.A.I. rules.

Aeroplanes at French Manœuvres.

THE arrangements made for the Grand Manœuvres which are to take place at Poitou shortly allow for the use of sixty-one aeroplanes, including twenty Blériots, fourteen Maurice Farman, seven Henry Farman, nine Deperdussins, four Hanriots, three Borels, two Nieuports and two Breguets.

Gaubert Flies back to Villacoublay.

HAVING completed his tests for the Michelin Target prizes, Gaubert decided that the only way to go back to Villacoublay was on his trusty Astra-Wright machine. He left Mourmelon in the morning, and reached his destination during the afternoon, having been obliged to make a landing *en route* on account of the weather.

Good Flight on Clement-Bayard Monoplane.

HAVING decided to make an attempt on the Coupe Pommery from Biarritz, Guillaux on his Clement-Bayard monoplane flew over from Bordeaux on the 28th ult., covering the distance in an hour and forty minutes at a height of 1,200 metres. A strong south-west wind made the going very unpleasant, and the aviator was violently sick.

A Maurice Farman Hydro-aeroplane.

ON the 29th ult. Maurice Farman was testing his new hydro-aeroplane over the Trou Sale at Buc and rose from and alighted on the surface of the water several times, the machine behaving splendidly.

Good Work at Maurice Farman School.

WITH his mechanic Pichon as passenger, Maurice Farman on the 28th ult. was flying for an hour on a new machine, and Lieut. Mouchard, by way of practising in view of attempting to qualify for a military *brevet*, was up for an hour and a-half. During the afternoon Lieut. Briault and Sappers Grandjean and Guesse flew over to St. Cyr. On the following day Lieut. Mouchard made a similar flight and Lieut. Gignoux, in order to test two new military M. Farman machines, piloted them to Etampes and back. Several of the military pilots were flying on Farman machines over the surrounding country. On Monday, after giving an Australian officer a trip on a new military machine, Maurice Farman took Derome to Etampes in order to see how the Farman schools were progressing and returned to Buc in the evening.

Long Trips on M. Farman Machines.

ON the 30th ult. Lieut. Varcin, accompanied by Sapper Lano, started from Toul on his M. Farman machine at 4 a.m., and eventually got to Buc at 10 a.m. after a very difficult journey owing to the changeable wind. On the same day Serjeant Havard, also on a Maurice Farman biplane, arrived at Buc from Sissonne Camp, having made the trip by way of St. Quentin and Rouen.

A Blériot for Altitude Records.

AT Houlgate, early on the morning of the 30th ult., trials were made with a new Blériot machine, which has been specially built for Garros in view of his proposed attack on the altitude record. On his ordinary machine Garros made a flight with André Dubonnet over the surrounding country.

New Blériot Superior Pilots.

FLYING over a circuit Etampes-Vendome-Orleans and back, Lieut. Adam Givonne on his Blériot, made a first trip for a superior *brevet* on the 30th ult. while Lieuts. Jacquet and Dupin started on the second test *via* Vendome and Cercottes but had to give up owing to the heavy rain. They, however, carried out the test on the following day.

A Cosmopolitan School.

AMONG the twenty-seven pupils at the Blériot School at Etampes no less than eleven different countries are represented. Many of the "fledglings," which include a dozen Frenchmen, three Servians, two Chilians, two Brazilians, two Italians, and one each from Greece, Austria, Spain, Russia, Cuba, and Bulgaria, are military officers who have been nominated by their respective Governments to acquire the art.

A Typical Day at Farman School at Etampes.

AT the Farman School at Etampes on Monday the flights by the various pupils totalled to over 1,200 kiloms., and yet no damage or *bois casse* was reported. Among the performances was a trip of an hour and a-half by Lieut. Hanne, and one of an hour by Lieut. Gignoux, over the surrounding country.

A Bristol Success in Germany.

A VERY fine flight in boisterous weather, when no other machine ventured out, was made last week by Lieutenant Detton, of the German Flying Corps on his Bristol monoplane. Leaving Halberstadt at 6.19 p.m. he steered in the direction of Doberitz, but some time afterwards, when darkness was setting in, he was a little uncertain as to his bearings, and planing down to a suitable field, found himself at Barby, having covered about 40 miles in 41 mins. Starting off again at daybreak he continued his trip in spite of an extremely strong wind, and succeeded in reaching Doberitz safely.

Night Flying in Spain.

POUMET and his Borel monoplane have been scoring a great success in Spain. Last week the pilot ascended at Pesconal after dark, and when in mid-air turned on the electric lights with which his machine had been decorated. The machine was promptly dubbed the "Fire-bird," and on descending Poumet had a rousing reception. On the 29th he flew over the Guadarrama Mountain.

KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Hand-launched	{ Distance ...	A. E. Woollard	477 yards.
	{ Duration ...	A. F. Houlberg	89 secs.
Off ground	{ Distance ...	F. W. Jannaway	84 yards.
	{ Duration ...	G. Rowlands	30 secs.
Hydro, off water—Duration	...	G. P. Bragg-Smith	25 secs.

A Competition for Hydro-aeroplanes rising off and alighting on the water, took place on Saturday, August 31st, at "The Welsh Harp," Hendon. Prizes: 1st, £3 and certificate; 2nd, £2 and certificate; 3rd, £1 and certificate; all presented by the Kite and Model Aeroplane Association. It attracted an entry of 34 competitors, and out of these, 30 faced the judges, and proved a most interesting and exciting contest. Results: 1. W. J. Williams, 87 marks (duration from time of rising off the water) 31.2 secs.; 2. H. Bate, 77, 26.4 secs.; 3. M. Gordon Jones, 71, 26 secs.; 4. L. H. Slatter, 70, 25 secs.; 5. Mrs. Stedman, 62, 18.4 secs.; 6. F. W. Jannaway, 61, 16.4 secs.; 7. Mingsin Kwei, 59, 22 secs.; 8. G. P. Bragg-Smith, 58, 22.6 secs.; 9. T. Ockenden, 53, 15 secs. It will be seen that Nos. 7 and 8 made better durations than 5 and 6, but not such good alighting on water as 5 and 6. Judges: Messrs. H. F. Lloyd, A.E.A.S., V. E. Johnson, M.A., F. Pringuer and W. H. Akehurst, hon. sec. There was a good crowd of spectators, and included the president, Col. F. C. Trollope and Col. J. D. Fullerton, vice-president, who were deeply interested in the scientific display given, and they stated that it was their hope that more people would become interested in these models.

Official Trials for the purpose of establishing Records.—The 1st official duration hydro trials took place at "The Welsh Harp," Hendon, after the above competition. Seven entered for these and the results were: G. P. Bragg-Smith, 25 secs.; H. Bate, 22 secs.; J. McBirnie, 17 secs.; F. W. Jannaway, 15 secs.

International Kite Competitions, Spa, Belgium.—This meeting took place August 18th to 25th. The only English competitor was Major B. Baden-Powell, who went out to try and carry off the honours for England. Bad luck dogged him throughout the meeting, and after perseverance he carried off a prize in the altitude competition. Messrs. F. Pringuer and W. H. Akehurst went out to help him in his endeavours. He was specially praised by the Belgium soldiers and by the French for his patience, pluck, and perseverance in competing in every event, although his winch was broken in transit on the railway.

27, Victory Road, Wimbledon.

W. H. AKEHURST, Hon. Sec.

MODEL CLUBS.

Aero-Models Assoc. (N. Branch) (15, HIGHGATE AVENUE, N.).

"ENFIELD" Challenge Cup and Medal contest, October 5th. Last Saturday experiments at Finchley with tractor models. Best results by Mr. B. Brown 35 secs. (club tractor record) and H. E. Fletcher. To-day, flying as usual at Finchley.

Blackheath Aero Club (48, HAFTON ROAD, CATFORD, S.E.).

ON Saturday, at Welsh Harp, in hydro competition, Williams obtained first prize. Good flights Sunday by Mr. Dennis at Blackheath, and at Wimbledon Common by Mr. Whitworth (hydro), Mr. Dollittle (r.o.g.). Flying at Grove Park and Blackheath week-end.

Coventry Aero Building Soc. (22, KINGSTON RD., EARLSDON).

SATURDAY, Mr. S. Shorter, Havelock, and Riley competing for English and Midland championships for distance and duration, also for R.O.G. Competition. Mr. L. G. Riley (tractor model), 31 secs.; Mr. A. Austin secured junior championship of Midlands; Mr. H. J. Goddard, assisted by Mr. Shorter, will give lessons to junior members commencing September 5th, continuing fortnightly.

Folkestone Ae.C. ("IMMINGHAM," MARTEN RD., FOLKESTONE).

FLYING next Wednesday and Saturday afternoons and evenings at Broadmead Meadow.

Hackney and District (THE HOLLIES, 47, JENNER ROAD, N.).

SATURDAY, Mr. Louch, with impromptu single screw, obtained 50 secs. duration. Official durations: Horsfield 51 (0-1-1 P2), Vans 53 (1-2-0 P2), Lewin 32 (1-1-0 P2), Carter 53 (1-1-0 P1), Barton 28 (1-1-0 P2).

Hendon Model Aero Club (8, MONTAGU ROAD, W. HENDON).

GOOD flying week before last by Hills and Doidge. Saturday and Sunday last models flown by Laurence, Hayward, Brown, Doidge, Hills, Barton and Mr. F. Short (r.o.g. biplane). To-day (Sat.) first meeting for club records.

Maidenhead ("THE ACACIAS," SPENCERS ROAD, MAIDENHEAD).

SEVERAL members flying Saturday, including Coxhead. Flying to-day, weather permitting.

Paddington and Districts (77, SWINDERLY ROAD, WEMELEY).

RESULT Duration Handicap: 1st prize, a stop watch, winner, S. Wood; 2nd prize, pair of carved propellers, M. Levy; 3rd prize, pair of carved propellers unfinished, M. Canning. To-day (Saturday) flying for certificates. September 14th, club's tractor competition. Mr. Johnson's tractor competition, probably September 28th.

Sheffield Model Aero Club (35, PENRHYN ROAD, SHEFFIELD).

COMPETITION for Colver Cup, Sept. 14th. Field for holding see FLIGHT Sep. 14th. To-day (Sat.) meeting Marsh Farm, High Lane, Ecclesall, at 3.

Southgate County School Ae.C. (72, NATAL RD., NEWSOUTHGATE).

GOOD flying during week by Messrs. Reed (200 yds.) and Redotée (23-in. model). The fuselage and tail of glider are now completed. The sec. would be pleased to receive model catalogues.

South Norwood (240, HOLMESDALE ROAD).

MONDAY last week flying by Streeter (twin model), Wise (single stick and tractor), Horricks (tractor). Horricks gets off ground in two yards.

Windsor Model Flying (10, ALMA ROAD, WINDSOR).

SATURDAY, E. Dowsett with new large dimension biplane flew well. S. Camm's hydroplane, with V. E. Johnson floats, rose quickly and made some short flights. Others flying: Camm, E. Stanbrook, Hamblin and Smith.

Yorkshire Ae.C. (Model Sec.) (53, WEST STREET, LEEDS).

FLYING to-day at Beeston. September 14th, open competition across lake at Roundhay Park, at 3.30. Three prizes.

Worcester Model Aero Club (CORN MARKET, WORCESTER).

ON 22nd inst. H. S. Melhuish, Jun., raised the club's duration record from 54 secs. to 79 secs. Pollard (over 60 secs.) and Colton flying well. On 24th postponed Birmingham competitions took place. Messrs. Baker and Mason, of Birmingham Aero Club, officiated. Results: Colton, duration (47 secs.), distance (235 yards); Pollard, (59 and 224 secs.); Melhuish, Jun., 83 secs. duration. Mr. Baker, of Birmingham, flew his heats at Worcester, and got 84 secs. duration and 240 yards distance.

AIRSHIP NEWS.

Long Voyage by New Clement-Bayard Airship.

AT 10.30 a.m. on Saturday last the new Clement-Bayard cruiser "Dupuy de Lome" left Lamotte Breuill for her duration test before being taken over by the French Government. Passing over Beauvais at 12.45 she continued on her way to the sea, and at 5 o'clock was over Dieppe. She followed the coast to Treport at a height of 1,500 metres, and during the night covered a circuit comprising Amiens, Abbeville, Montdidier, Soissons, and returned to Lamotte Breuill on Sunday morning at 6 a.m., having been in the air for 19½ hours. Those on board included M. Sabatier, M. Baudry, Lieut. Derezant, representing the Minister of War, two sergeants, two mechanics and a second pilot.

Tests with "Adjutant Reau."

WITH a crew of ten persons on board the Astra dirigible "Adjutant Reau" which has just been reinflated in view of the forthcoming manoeuvres made an hour's cruise round Paris on Sunday morning. A similar one was made on Monday morning from Issy to the West of Paris.

Long Cruise by Russian Dirigible.

A NEW Russian dirigible "Iastrel" made a 24 hours' cruise on the 23rd ult., piloted by Capt. Chabsky and with a crew of eight on board. At the end of last week she made a trip of eight hours in the neighbourhood of Krasnoie Selo where she is stationed for the manoeuvres.

Zeppelin II Damaged.

ZEPPELIN II, which had been ordered to take part in the German Army Manoeuvres will be absent as the result of a smash on Saturday last. She had been taken from her shed at Cologne in preparation for a trial flight when a sudden gust of wind tore her from her human anchor of soldiers and drove her against the walls of her shed, resulting in the fore part of the vessel being badly smashed, and two of the soldiers had to be taken to the hospital.

A New Zeppelin Dirigible.

IN the Zeppelin works at Freidrichshafen a new Zeppelin for military work is being built, which, it is stated, will be capable of remaining in the air for two full days at a minimum height of 1,500 metres. She is to lift a useful load of 6,000 lbs., while the designers anticipate a speed of over 50 miles an hour.

A Passenger Record by Hansa.

THE Zeppelin liner Hansa left Hamburg at 8.10 a.m. on the 29th ult. with fourteen passengers on board, and after a visit to Brunswick returned to Hamburg at 3 o'clock in the afternoon. On Monday a record was created by taking 42 passengers in addition to the crew of fifteen. The airship was damaged on Tuesday through colliding with the roof of her shed.

Over the Alps in a Balloon.

ACCOMPANIED by a *Daily Mirror* photographer, Capt. Spelterini started from Interlaken in a balloon on Friday of last week, and after a trip of sixteen hours landed near Unterammergau having passed over the Central Alps, the Bavarian Alps, the Zugspitze and the Hoellekland. The maximum height attained was about 17,500 feet, while the lowest temperature was 21°2 degrees F.



Hydro-Aeroplanes in Germany.

ALTHOUGH the German Naval Authorities had offered good prizes, the meeting for hydro-aeroplanes organised by the Federation of German aviators at Heiligendam was not a striking success. On the 29th ult., the opening day, Thelen, Von Gorrison and Buechner each tried their machines, but could not get them to rise from the water, and on the following day Thelen was the only one after several attempts to get into the air and he kept going for 20 mins. On Saturday morning there was a good deal of rain, but Von Gorrison, after many trials, got into the air only to be brought down by motor trouble, and Buechner, who started from land, was brought down by the same cause after a quarter of an hour.

The Circuit of Berlin.

OF the sixteen competitors who started in the flight round Berlin on Saturday last only three succeeded in getting round in good time. These were Lieutenants Krueger, in 1 hr. 21 mins.; Bauerlin, in 1 hr. 53 mins.; and Caspar in 3 hrs. 32 mins. On the following day two rounds had to be made, making the total distance 303 kiloms. The result was (1) Lieutenant Krueger, 3 hrs. 45 mins.; (2) Bauerlin, 3 hrs. 54 mins.; (3) Caspar, 6 hrs. 12 mins.; (4) Hirth, 13 hrs. 20 mins.; (5) Faller, 16 hrs. 6 mins. On the second day Hirth easily made the best performance by doing the two rounds in 1 hr. 43 mins.

CORRESPONDENCE.

Correspondents communicating with regard to letters which have appeared in FLIGHT, would much facilitate ready reference by quoting the number of each letter.

"Cellon" on the Avro.

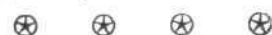
[1618] We noticed in the last issue of FLIGHT that you stated that "Cellon" Transparent sheets were used for windows on the Avro biplane during its flight in the rain in the Military Aeroplane Competitions. We beg to point out that this is not quite correct, for, although Mr. A. V. Roe had some of our Transparent material, he did not find it necessary to use it.

What you no doubt meant was that "Cellon" Dope was used on the fabric of this machine and, owing to its exceptional waterproof qualities, the fabric was in perfect condition when the machine descended.

THE CELLON COMPANY.

A. J. A. WALLACE BARR, Secretary.

49, Queen Victoria Street, E.C.



The Elliott Instrument Board.

IN referring to this instrument board in our account of the Military Aeroplane Trials in last week's issue, we forgot that Messrs. Elliott Bros. had moved into their premises at Central Buildings, Westminster, and therefore no longer occupy their old showrooms in Leicester Square, to which we advised readers of FLIGHT to address their enquiries. Will our readers please note.

A Very Complete Catalogue.

ONE of the most complete catalogues of accessories for aviators is that published by Aera, 16, Avenue de la Grande Armée, Paris. It is divided into five parts—material, accessories, tools, instruments and equipment. In each of these departments the stock carried appears to be very complete, and to include practically everything that could be needed by an aeroplane builder or pilot. Among other specialities is the Aera compass, which has been adopted by the French military authorities, and has an arrangement for correcting the drift due to the wind. Another speciality is the S.A.F. sustentation indicator, which keeps the pilot informed as to changes of relative speed, &c.



[Owing to the importance of the Military Trials causing exceptional claim upon our space, a number of letters and other usual features are held over this week.—Ed.]



Aeronautical Patents Published.

Applied for in 1911.

Published September 5th, 1912.

- 18,165. J. GREGOIRE. Safety parachute for aeroplanes and airships.
- 18,373. L. G. YOUNG. Flying machines.
- 18,730. A. FLETCHER. Controlling plane for flying machines.

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